Higher-order chiral Lagrangians with vector meson nonet in different representations*

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Abstract: In this paper, chiral Lagrangians with a vector meson nonet are constructed across multiple representations, including those at the next-to-leading order in the vector-field representation, as well as at the next-to-next-to-leading order in the tensor-field and hidden local symmetry representations. For the next-to-leading order octet, redundant terms identified in other literature are also addressed in both the tensor-field and hidden local symmetry representations. Furthermore, the equivalence between the tensor-field and hidden local symmetry representations is examined.

Keywords: effective field theory, quantum chromodynamics, chiral perturbation theory, vector mesons

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I. INTRODUCTION

Quantum chromodynamics (QCD) is the fundamental theory describing strong interactions. However, due to non-perturbative effects, QCD often cannot provide precise predictions in the low-energy region. To study low-energy QCD involving pseudoscalar mesons, one can employ an effective theory at the hadronic level, leveraging chiral symmetry and its spontaneous breaking. This approach is known as chiral perturbation theory (ChPT) [1−5]. ChPT serves as an effective field theory of QCD at low energies. In ChPT, the chiral Lagrangian encompasses all effective interactions that respect Lorentz invariance, chiral symmetry, charge conjugation, and parity. Rather than an expansion in terms of the large strong coupling constant, ChPT is formulated as an expansion in the typical momentum scale (p). According to Weinberg's power-counting rule, tree-level and loop diagrams contribute terms proportional to powers of p/Λ, where Λ represents the chiral symmetry-breaking scale. Thus, calculating a physical quantity with a specific accuracy requires only a finite number of interactions. Currently, pseudoscalar mesonic chiral Lagrangians have been constructed up to $O(p^8)$ in both $SU(2)$ and $SU(3)$ symmetries [4−10].

ChPT can be extended to higher-energy ranges to incorporate additional particles, such as vector mesons, which exhibit unique properties. With masses that fall between those of pseudoscalar mesons and baryons, vector mesons present challenges for consistent power counting [11, 12]. In the literature, vector mesons are sometimes treated as light degrees of freedom [13−28], while other studies treat them as heavy degrees of freedom [29−34].

Several representations are used to describe vector mesons: the traditional vector-field (or matter-field/Proca field) representation [35, 36], the antisymmetric tensor-field representation [4, 36, 37], the hidden local symmetry (HLS) representation [38−46], and the massive Yang-Mills representation [47−51]. This work focuses on the first three, as the massive Yang-Mills representation is seldom used today.

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While distinct, these representations are interrelated. The vector-field representation, the most traditional, has its connections to other representations thoroughly documented in Refs. [36, 45, 52−54]. In the tensor-field representation, vector mesons are represented by antisymmetric tensors, which transform homogeneously under chiral symmetry [36, 37, 52, 54]. The vector-field and tensor-field representations share many similarities, with some studies treating them together [36, 52, 54]. The tensor-field representation offers certain advantages: it provides a straightforward generalization of the Dirac equation for spin-1/2 particles to spin-1 particles and corresponds to the $(1,0)\oplus(0,1)$ representation of the Lorentz group, naturally encompassing two spin-1 degrees of freedom among its six degrees of freedom. In contrast, the vector-field representation uses the (1/2, 1/2) Lorentz representation, requiring an auxiliary condition to eliminate the unwanted spin-0 component. The tensor-field Lagrangian is also simpler in form than that of the vector-field representation. Further details on the relations between these two representations can be found in Refs. [36, 43, 52−54].

In the HLS representation, an artificial local symmetry is introduced into the nonlinear sigma model through the choice of specific field variables, which can be removed by selecting a gauge, such as the unitary gauge. This gauge symmetry is not a true symmetry but a redundancy in the description. The HLS representation's connections with other representations are discussed in Refs. [36, 43, 45, 55]. The massive Yang-Mills representation is a particular gauge choice within the generalized HLS model, determined by specific parameter values, with further relations to other representations elaborated in Refs. [36, 56−58].

Two types of equivalence relations exist among these representations [54, 55]. The first type indicates that different representations share the same structure without integrating out vector mesons [43, 45], while the second type arises when different representations yield equivalent results after vector fields are integrated out [36, 52, 54]. The first type of equivalence applies at the level of resonance Lagrangians, whereas the second applies at the level of pseudoscalar mesonic chiral Lagrangians. Importantly, the first-type equivalences imply the second-type, but the reverse is not necessarily true.

After integrating out the vector fields and comparing with pseudoscalar mesonic chiral Lagrangians [4, 5, 7, 59], the equivalence of these representations at the level of pseudoscalar mesonic chiral Lagrangians becomes evident [36, 52, 54]. A recent approach, the first-order formalism, enables the calculation of resonance contributions to low-energy constants (LECs) in ChPT at next-to-next-to-leading order (NNLO) by integrating out vector fields [54]. This method underscores the equivalence between the vector-field and tensor-field representations at the NNLO level.

Currently, although there is extensive research on ChPT with vector mesons, most studies focus on treating vector mesons as resonance states to investigate the properties of pseudoscalar mesons [60−66]. For such purposes, the lower-order chiral Lagrangian is usually sufficient. However, some studies concentrate on vector mesons themselves, analyzing aspects such as their masses [30, 67−72], electromagnetic properties [23, 73], decay constants [28, 74], radiative decays [16, 75], and scattering with other particles at high energies [22, 46, 76−78]. Research on vector mesons at the next-to-leading order (NLO) has also been conducted, and studies at the NNLO are emerging [63−66, 71].

To date, vector mesonic chiral Lagrangians have been developed up to NLO in the tensor-field and HLS representations [36, 38, 42, 63]. However, for studies focused on vector mesons themselves, lower-order Lagrangians may not offer the required accuracy. In this paper, we systematically construct chiral Lagrangians for the vector-field, tensor-field, and HLS representations, extending to NNLO and covering both the normal and anomalous cases, and the strong equivalence between the tensor-field and HLS representations is also analyzed. Additionally, to expand the application scope of the chiral Lagrangian, the singlet vector meson is also considered, *i.e.*, the chiral Lagrangian is expanded to the vector meson nonet. This Lagrangian can be applied not only to low-energy vector mesons but also to heavy-vector-meson fields. For example, when J/Ψ is treated as a vector meson singlet, it can be used to study the interaction between J/Ψ and pseudoscalar mesons [79−81].

While multi-vector-meson interactions have been explored in earlier research, the complexity of these interactions in the vector-field and tensor-field representations has often restricted studies to single-vector-meson vertices. Consequently, our analysis concentrates on single-vector-meson vertices within these representations. Although higher-order chiral Lagrangians contain numerous terms, only a few play a significant role in specific physical phenomena. Advances in technology and the development of specialized software and computer algebra systems now enable efficient handling of the computational challenges posed by these complex terms.

This paper focuses on a tree-level analysis. Extending the discussion to include loop diagrams poses significant challenges, as the presence of vector mesons disrupts the conventional power-counting rule [68]. Specifically, loop diagrams introduce large imaginary components that violate power counting, and these terms cannot be absorbed using standard counterterms or renormalized parameters within the traditional renormalization scheme. Currently, the only viable solution to this problem is the complex-mass scheme [69, 82−91]. In this scheme, the masses and widths of vector mesons are as-

signed power-counting orders of $O(p^0)$ and $O(p^1)$, respectively. The power-counting rule for a vector meson propagator depends on the external momenta: it is counted as $O(p^0)$ if it carries large external momentum and $O(p^1)$ otherwise. Additionally, derivatives acting on vector mesons are assigned an order of $O(p^0)$. Meanwhile, the power counting for pseudoscalar mesons remains consistent with standard pseudoscalar mesonic ChPT. In the complex-mass scheme, power-counting violations can be controlled by introducing additional counterterms, albeit with more complex parameter structures. This approach preserves the power-counting rule, allowing for the application of the chiral expansion even at the loop level.

This paper is structured as follows. Sec. II provides a brief overview of pseudoscalar and vector mesons in ChPT. Secs. III to V detail the methods for constructing chiral Lagrangians with vector mesons in the vector-field, tensor-field, and HLS representations, respectively. Sec. VI outlines the resulting chiral Lagrangians, while Sec. VII examines the equivalence between the HLS and tensor-field representations. Finally, Sec. VIII provides a summary and some comments.

II. MESONS IN CHIRAL PERTURBATION THEORY

In QCD, the Lagrangian with external sources is

$$\mathscr{L}_{\rm QCD} = \mathscr{L}^0_{\rm QCD} + \bar{q}\gamma_\mu(v^\mu + a^\mu\gamma_5)q - \bar{q}(s - {\rm i}p\gamma_5)q, \tag{1}$$

where $\mathscr{L}^0_{\rm QCD}$ is the original QCD Lagrangian, and q denotes the light quark fields. Here, v^μ, a^μ, s, and p represent the vector, axial-vector, scalar, and pseudoscalar sources, respectively. For simplicity, the tensor source and the θ term are omitted. To facilitate comparison with the pseudoscalar mesonic chiral Lagrangian, a^μ is considered traceless, and v^μ is allowed to be non-traceless only in the two-flavor anomalous part; in other contexts, it is assumed to be traceless.

If the masses of the light quarks are neglected, the QCD Lagrangian exhibits a global $SU(N_f)_L \times SU(N_f)_R$ chiral symmetry, where $N_f = 2$ or 3. This symmetry spontaneously breaks to an $SU(N_f)_V$ symmetry, resulting in the emergence of pseudoscalar Goldstone bosons associated with the symmetry breaking. These bosons correspond to the lowest pseudoscalar mesons, represented by U. Under a chiral transformation, U transforms as $U \to g_L U g_R^\dagger$, where g_R and g_L are elements of the $SU(N_f)_L$ and $SU(N_f)_R$ chiral groups, respectively.

For convenience, an auxiliary field u is introduced to describe the pseudoscalar meson fields, with $u^2 = U$ [92, 93]

$$U(x) = \exp\left(\frac{{\rm i}\sqrt{2}}{F_0}\pi(x)\right), \tag{2}$$

where F_0 is a low-energy constant, and $\pi(x)$ represents pseudoscalar meson fields,

$$\begin{aligned}\pi(x) &= \sum_{i=1}^{8}\frac{1}{\sqrt{2}}\lambda_i\pi_i(x)\\ &= \begin{pmatrix} \frac{\pi^0}{\sqrt{2}} + \frac{\eta_8}{\sqrt{6}} & \pi^+ & K^+ \\ \pi^- & -\frac{\pi^0}{\sqrt{2}} + \frac{\eta_8}{\sqrt{6}} & K^0 \\ K^- & \bar{K}^0 & -\frac{2\eta_8}{\sqrt{6}} \end{pmatrix},\end{aligned} \tag{3}$$

where λ_i are the Gell-Mann matrices. The chiral transformation of the pseudoscalar meson fields $\pi(x)$ is nonlinear, often referred to as a nonlinear realization. Under a chiral transformation, u transforms as $u \to g_L u h^\dagger = h u g_R^\dagger$, where h is a compensator field dependent on the meson fields. This transformation property of u facilitates the construction of chiral Lagrangians, which we will employ in this paper. For further details on ChPT, readers may consult Refs. [92–94] and the references therein.

The vector meson nonet is represented by a 3×3 matrix in the vector-field representation,

$$V^\mu = \begin{pmatrix} \frac{\rho^0}{\sqrt{2}} + \frac{\omega_8}{\sqrt{6}} + \frac{\omega_0}{\sqrt{3}} & \rho^+ & K^{*+} \\ \rho^- & -\frac{\rho^0}{\sqrt{2}} + \frac{\omega_8}{\sqrt{6}} + \frac{\omega_0}{\sqrt{3}} & K^{*0} \\ K^{*-} & \bar{K}^{*0} & -\frac{2\omega_8}{\sqrt{6}} + \frac{\omega_0}{\sqrt{3}} \end{pmatrix}^\mu. \tag{4}$$

The vector field V^μ transforms as $V^\mu \to hV^\mu h^\dagger$ under chiral rotations. In the tensor-field representation, V^μ is replaced by an antisymmetric tensor $W^{\mu\nu}$, where each element of V^μ corresponds to an antisymmetric tensor field. The HLS representation is more complex and will be discussed in detail in Sec. V.

To account for finer effects such as $\rho^0 - \omega$ mixing [95] or $\omega - \phi$ mixing [96], ρ^0, ω_8, and ω_0 should be included in the mixing. For ideal mixing,

$$\begin{pmatrix}\omega^\mu \\ \phi^\mu\end{pmatrix} = \begin{pmatrix} \sqrt{\frac{1}{3}} & \sqrt{\frac{2}{3}} \\ -\sqrt{\frac{2}{3}} & \sqrt{\frac{1}{3}} \end{pmatrix}\begin{pmatrix}\omega_8^\mu \\ \omega_0^\mu\end{pmatrix}. \tag{5}$$

This paper does not assume isospin symmetry. If one considers isospin breaking, such as the mass difference between ρ^0 and $\rho^\pm$, then ρ^0, ω, and ϕ mixing must be in-

cluded, and s should be replaced by $\mathrm{diag}(m_u, m_d, m_s)$ in the calculation [30, 67].

The following three sections discuss the construction of chiral Lagrangians with vector mesons in different representations. In this paper, we restrict our focus to single-vector-meson vertices within the vector-field and tensor-field representations.

III. VECTOR-FIELD REPRESENTATION

A. Building blocks and transformation properties

In addition to the vector meson fields, the building blocks in the vector-field representation are identical to those in the pseudoscalar mesonic chiral Lagrangians [7, 59].

$$\begin{aligned} u^\mu &= \mathrm{i}\left\{u^\dagger(\partial^\mu - \mathrm{i}r^\mu)u - u(\partial^\mu - \mathrm{i}\ell^\mu)u^\dagger\right\}, \\ \chi_\pm &= u^\dagger\chi u^\dagger \pm u\chi^\dagger u, \\ f_+^{\mu\nu} &= uF_L^{\mu\nu}u^\dagger + u^\dagger F_R^{\mu\nu}u, \\ f_-^{\mu\nu} &= uF_L^{\mu\nu}u^\dagger - u^\dagger F_R^{\mu\nu}u = -\nabla^\mu u^\nu + \nabla^\nu u^\mu, \\ h^{\mu\nu} &= \nabla^\mu u^\nu + \nabla^\nu u^\mu, \end{aligned} \tag{6}$$

where $r^\mu = v^\mu + a^\mu$, $\ell^\mu = v^\mu - a^\mu$, $\chi = 2B_0(s + \mathrm{i}p)$, $F_R^{\mu\nu} = \partial^\mu r^\nu - \partial^\nu r^\mu - \mathrm{i}[r^\mu, r^\nu]$, $F_L^{\mu\nu} = \partial^\mu \ell^\nu - \partial^\nu \ell^\mu - \mathrm{i}[\ell^\mu, \ell^\nu]$, and B_0 is a constant related to the quark condensate. These building blocks exhibit the same chiral rotation properties as V^μ, *i.e.*, $X \to hXh^\dagger$, where X represents any building block. The covariant derivative is defined by

$$\nabla^\mu X = \partial^\mu X + [\Gamma^\mu, X], \tag{7}$$

where Γ_μ represents the chiral connection,

$$\Gamma^\mu = \frac{1}{2}\left\{u^\dagger(\partial^\mu - \mathrm{i}r^\mu)u + u(\partial^\mu - \mathrm{i}\ell^\mu)u^\dagger\right\}. \tag{8}$$

To construct the vector mesonic chiral Lagrangians, the vector fields V^μ, X, and their derivatives are considered. Some studies also introduce a building block $\hat{V}^{\mu\nu} = \nabla^\mu V^\nu - \nabla^\nu V^\mu$ [36, 54]. However, since only single-vector-meson vertices are considered, the covariant derivatives acting on V^μ can be transferred to other building blocks through partial integration, as will be discussed in Eq. (10). Therefore, aside from the kinetic term, this building block is not included.

In addition to chiral symmetry, chiral Lagrangians must also be invariant under parity (P), charge conjugation (C), and Hermitian conjugation (h.c.) transformations. The transformation properties of these building blocks have been extensively discussed in the literature [7, 36, 37, 59]. ChPT is typically expanded in powers of the momentum (p) of the external source, denoted as $O(p^n)$, where n is referred to as the chiral dimension (abbreviated as Dim). Table 1 summarizes these properties for reference.

Table 1. The chiral dimension (Dim), parity (P), charge conjugation (C), and hermiticity (h.c.) of the building blocks in the vector-field and tensor-field representations are analyzed.

	Dim	P	C	h.c.
u^μ	1	$-u_\mu$	$(u^\mu)^T$	u^μ
$h^{\mu\nu}$	2	$-h_{\mu\nu}$	$(h^{\mu\nu})^T$	$h^{\mu\nu}$
$\chi_\pm$	2	$\pm\chi_\pm$	$(\chi_\pm)^T$	$\pm\chi_\pm$
$f_\pm^{\mu\nu}$	2	$\pm f_{\pm\mu\nu}$	$\mp(f_\pm^{\mu\nu})^T$	$f_\pm^{\mu\nu}$
V^μ	0	V_μ	$-(V^\mu)^T$	V^μ
$W^{\mu\nu}$	0	$W_{\mu\nu}$	$-(W^{\mu\nu})^T$	$W^{\mu\nu}$
$\varepsilon^{\mu\nu\lambda\rho}$	0	$-\varepsilon_{\mu\nu\lambda\rho}$	$\varepsilon^{\mu\nu\lambda\rho}$	$\varepsilon^{\mu\nu\lambda\rho}$

The vector meson masses are approximately [97]

$$\rho^\pm, \rho^0(775\ \mathrm{MeV}),\ \omega(782\ \mathrm{MeV}),\ K^{*\pm}, K^{*0}, \bar{K}^{*0}(894\ \mathrm{MeV}). \tag{9}$$

Their masses fall between those of the pseudoscalar mesons and baryons. These mesons can be considered either light or heavy degrees of freedom, depending on the context. In this paper, we assume $V^\mu = O(p^0)$. The chiral dimensions of the other building blocks are consistent with those in the pseudoscalar mesonic chiral Lagrangians [11, 45]. Table 1 provides a summary of these power-counting rules.

Furthermore, each covariant derivative applied to the first six building blocks contributes an additional $O(p^1)$ order. For the anomalous part, the Levi-Civita tensor $\varepsilon^{\mu\nu\lambda\rho}$ is also necessary. The aforementioned power-counting rule is effective at the tree level. For loop contributions, the complex-mass scheme should be employed, as discussed in the introduction.

B. Constraint relations

The chiral Lagrangian must satisfy all the symmetries discussed above. Constructing a complete set that adheres to these symmetries is straightforward; however, the terms in this set are typically not linearly independent. To achieve a linearly independent chiral Lagrangian, the following linear constraint relations must be considered [6–9, 36, 37].

(i) **Partial Integration.** Given that derivatives applied to the entire Lagrangian can be disregarded, we obtain the following identity:

$$\langle\nabla^\mu AB\cdots\rangle\langle C\cdots\rangle+\langle A\nabla^\mu B\cdots\rangle\langle C\cdots\rangle +\langle AB\cdots\rangle\langle\nabla^\mu C\cdots\rangle+\text{other terms}=0, \tag{10}$$

where A, B, and C are generic building blocks, "$\langle\cdots\rangle$" denotes the flavor trace, and "$\cdots$" represents additional blocks as necessary. This relation indicates that one of the terms in Eq. (10) is redundant and can be omitted. Since our focus is on single-vector-meson vertices, the covariant derivatives initially applied to V^μ can be systematically transferred to the other building blocks. This transfer eliminates the necessity for terms involving $\hat{V}^{\mu\nu}$ or $\nabla^\mu V^\nu$.

(ii) **Equations of Motion (EOMs).** The leading-order(LO) EOMs are crucial for the construction of chiral Lagrangians [7]. For pseudoscalar mesons, the LO EOM is

$$\nabla^\mu u_\mu=\frac{\mathrm{i}}{2}\left(\chi_- -\frac{1}{N_f}\langle\chi_-\rangle\right). \tag{11}$$

With this relation, $\nabla^\mu u_\mu$ can be substituted with alternative expressions, thereby excluding it from the chiral Lagrangian.

For vector mesons, the LO Lagrangian is provided by [36]

$$\mathcal{L}_2=-\frac{1}{4}\left\langle\hat{V}_{\mu\nu}\hat{V}^{\mu\nu}-2M_V^2V_\mu V^\mu\right\rangle. \tag{12}$$

This Lagrangian results in the Klein-Gordon equation and an auxiliary condition:

$$(\nabla_\nu\nabla^\nu+M_V^2)V^\mu\doteq 0,\quad \nabla_\mu V^\mu\doteq 0, \tag{13}$$

where "$\doteq$" denotes equivalence up to higher-order terms or terms of the same order with fewer covariant derivatives. This notation is meaningful because terms of the same order but with fewer derivatives are already included according to our procedure for listing allowable terms. These equations imply that $\nabla_\nu\nabla^\nu V^\mu$ and $\nabla_\mu V^\mu$ can be transformed into alternative forms. By applying partial integration, Eq. (13) can be reformulated as

$$V^\mu\nabla^\rho\nabla_\rho O_\mu\doteq 0,\quad V^\mu\nabla_\mu O\doteq 0, \tag{14}$$

where O and O_μ represent any products of building blocks with the appropriate indices. The omitted terms do not compromise the structural integrity of the chiral Lagrangian.

(iii) **Bianchi Identity.** Utilizing the definitions provided in Sec. III.A, the Bianchi identity is derived as follows:

$$\nabla^\mu\Gamma^{\nu\rho}+\nabla^\nu\Gamma^{\rho\mu}+\nabla^\rho\Gamma^{\mu\nu}=0, \tag{15}$$

where, for any building block X,

$$[\nabla^\mu,\nabla^\nu]X=[\Gamma^{\mu\nu},X], \tag{16}$$

$$\Gamma^{\mu\nu}=\frac{1}{4}[u^\mu,u^\nu]-\frac{\mathrm{i}}{2}f_+^{\mu\nu}. \tag{17}$$

Two specific cases are

$$\nabla^\mu f_-^{\nu\alpha}+\nabla^\nu f_-^{\alpha\mu}+\nabla^\alpha f_-^{\mu\nu} =\frac{\mathrm{i}}{2}\left(\left[f_+^{\mu\nu},u^\alpha\right]+\left[f_+^{\nu\alpha},u^\mu\right]+\left[f_+^{\alpha\mu},u^\nu\right]\right), \tag{18}$$

$$\nabla^\mu f_+^{\nu\alpha}+\nabla^\nu f_+^{\alpha\mu}+\nabla^\alpha f_+^{\mu\nu} =\frac{\mathrm{i}}{2}\left(\left[f_-^{\mu\nu},u^\alpha\right]+\left[f_-^{\nu\alpha},u^\mu\right]+\left[f_-^{\alpha\mu},u^\nu\right]\right). \tag{19}$$

(iv) **Schouten Identity.** In the anomalous sections, the Levi-Civita tensor $\epsilon^{\mu\nu\alpha\beta}$ is utilized. As there is no totally antisymmetric fifth-order tensor in four-dimensional spacetime, the Schouten identity implies

$$S^\gamma\epsilon^{\mu\nu\alpha\beta}-S^\mu\epsilon^{\gamma\nu\alpha\beta}-S^\nu\epsilon^{\mu\gamma\alpha\beta}-S^\alpha\epsilon^{\mu\nu\gamma\beta}-S^\beta\epsilon^{\mu\nu\alpha\gamma}=0, \tag{20}$$

where S^μ denotes any operator.

(v) **Cayley-Hamilton Relations.** All building blocks are $N_f\times N_f$ matrices in flavor space. The Cayley-Hamilton theorem establishes relations among these matrices.

For $SU(2)$,

$$\{A,B\}=A\langle B\rangle+B\langle A\rangle+\langle AB\rangle-\langle A\rangle\langle B\rangle, \tag{21}$$

where A and B are any 2×2 matrices.

For $SU(3)$,

$$\begin{aligned}&ABC+ACB+BAC+BCA+CAB+CBA-AB\langle C\rangle\\&-AC\langle B\rangle-BA\langle C\rangle-BC\langle A\rangle-CA\langle B\rangle-CB\langle A\rangle-A\langle BC\rangle\\&-B\langle AC\rangle-C\langle AB\rangle-\langle ABC\rangle-\langle ACB\rangle+A\langle B\rangle\langle C\rangle+B\langle A\rangle\langle C\rangle\\&+C\langle A\rangle\langle B\rangle+\langle A\rangle\langle BC\rangle+\langle B\rangle\langle AC\rangle+\langle C\rangle\langle AB\rangle-\langle A\rangle\langle B\rangle\langle C\rangle=0,\end{aligned} \tag{22}$$

where A, B, and C are arbitrary 3×3 matrices.

IV. TENSOR-FIELD REPRESENTATION

The tensor-field representation is similar to the vector-field representation. The building blocks are nearly identical to those in Table 1, except that V^μ is substituted with $W^{\mu\nu}$. The transformation properties and power-counting rules for $W^{\mu\nu}$ are also provided in Table 1.

In the tensor-field representation, the linear relations are similar to those in the vector-field representation, with the main distinction being the EOMs for vector mesons. The tensor field $W^{\mu\nu}$ is antisymmetric, satisfying $W^{\mu\nu} = -W^{\nu\mu}$. Utilizing the methods described in Refs. [37, 68, 98], Eq. (13) is replaced by

$$(\nabla_\rho\nabla^\rho + M_V^2)W^{\mu\nu} \doteq 0, \quad \nabla^\lambda W^{\rho\sigma} + \nabla^\rho W^{\sigma\lambda} + \nabla^\sigma W^{\lambda\rho} \doteq 0. \tag{23}$$

Additionally, an auxiliary condition is provided by [37, 52, 68, 98, 99]

$$\nabla_\rho W^{\rho\mu} \doteq 0. \tag{24}$$

For historical reasons, we adhere to the convention in Eq. (23), where the degrees of freedom W^{ij} are fixed, whereas W^{0i} are dynamic. Through partial integration, Eq. (23) results in the following two linear relations:

$$W_{\mu\nu}\nabla_\rho(R^{\mu\nu\rho} + R^{\nu\rho\mu} + R^{\rho\mu\nu}) \doteq 0, \quad W_{\mu\nu}\nabla_\rho\nabla^\rho C^{\mu\nu} \doteq 0, \tag{25}$$

where $R^{\mu\nu\rho}$ denotes an operator with three indices, and $C^{\mu\nu}$ represents an operator with two indices.

V. HLS REPRESENTATION

The HLS representation differs significantly from the vector-field and tensor-field representations. This section offers a brief overview; further details are available in Refs. [38−40, 42, 43, 45, 100].

A. Definitions

In the HLS representation, vector mesons are conceptualized as gauge fields, with their masses originating from the Brout-Englert-Higgs mechanism. The HLS framework is constructed on the $G_{\rm global}\times H_{\rm local}$ symmetry, where $G = SU(N_f)_L \times SU(N_f)_R$ signifies the global symmetry, and H represents the HLS. This $G_{\rm global}\times H_{\rm local}$ symmetry can be broken down into an H symmetry, which corresponds to flavor symmetry. The U field from ChPT can be decomposed into two fields, ξ_L and ξ_R, as

$$U = \xi_L^\dagger\xi_R. \tag{26}$$

The two fields, ξ_L and ξ_R, satisfy the following transformation properties under the $G_{\rm global}\times H_{\rm local}$ symmetry:

$$\xi_{L,R}(x) \to h(x)\cdot\xi_{L,R}(x)\cdot g_{L,R}^\dagger, \tag{27}$$

where $h(x) \in H_{\rm local}$ and $g_{L,R} \in SU(N_f)_L \times SU(N_f)_R$. Two Maurer-Cartan 1-forms are

$$\alpha_\perp^\mu = \frac{1}{2i}(\partial^\mu\xi_R\cdot\xi_R^\dagger - \partial^\mu\xi_L\cdot\xi_L^\dagger), \tag{28}$$

$$\alpha_\parallel^\mu = \frac{1}{2i}(\partial^\mu\xi_R\cdot\xi_R^\dagger + \partial^\mu\xi_L\cdot\xi_L^\dagger). \tag{29}$$

Their chiral transformation properties under the full symmetry are

$$\alpha_\perp^\mu \to h(x)\cdot\alpha_\perp^\mu\cdot h^\dagger(x), \tag{30}$$

$$\alpha_\parallel^\mu \to h(x)\cdot\alpha_\perp^\mu\cdot h^\dagger(x) - \mathrm{i}\partial^\mu h(x)\cdot h^\dagger(x). \tag{31}$$

The relations between $\alpha_\perp^\mu$, $\alpha_\parallel^\mu$, and the building blocks in the vector-field and tensor-field representations are $\alpha_\perp^\mu = \frac{1}{2}u^\mu$ and $\alpha_\parallel^\mu = \mathrm{i}\Gamma^\mu$. The covariant derivatives of $\xi_{L,R}$ are expressed as

$$D^\mu\xi_L = \partial^\mu\xi_L - \mathrm{i}K^\mu\xi_L + \mathrm{i}\xi_L l^\mu, \tag{32}$$

$$D^\mu\xi_R = \partial^\mu\xi_R - \mathrm{i}K^\mu\xi_R + \mathrm{i}\xi_R r^\mu, \tag{33}$$

where K^μ are the gauge fields associated with $H_{\rm local}$. Under a chiral transformation, K^μ transforms as

$$K^\mu \to h(x)K^\mu h^\dagger(x) - \mathrm{i}\partial^\mu h(x)h^\dagger(x). \tag{34}$$

Using K^μ fields, the covariant 1-forms are defined as

$$\hat{\alpha}_\perp^\mu = \frac{1}{2\mathrm{i}}\left(D^\mu\xi_R\cdot\xi_R^\dagger - D^\mu\xi_L\cdot\xi_L^\dagger\right), \tag{35}$$

$$\hat{\alpha}_\parallel^\mu = \frac{1}{2\mathrm{i}}\left(D^\mu\xi_R\cdot\xi_R^\dagger + D^\mu\xi_L\cdot\xi_L^\dagger\right). \tag{36}$$

The quantity $\hat{\alpha}_\parallel^\mu$ is associated with the vector field V^μ in the standard vector-field representation as follows:

$$\xi\hat{\alpha}_\parallel^\mu = V^\mu, \tag{37}$$

where ξ is a parameter associated with the redefinition of

V^μ in the HLS representation. The chiral transformation properties of $\hat{\alpha}^\mu_\perp$ and $\hat{\alpha}^\mu_\parallel$ are as follows:

$$\hat{\alpha}^\mu_{\perp,\parallel} \to h(x)\hat{\alpha}^\mu_{\perp,\parallel}h^\dagger(x). \tag{38}$$

The field strength of the HLS gauge boson is defined as

$$V^{\mu\nu} = \partial^\mu K^\nu - \partial^\nu K^\mu - \mathrm{i}\,[K^\mu, K^\nu]\,. \tag{39}$$

The LO chiral Lagrangian in this representation is

$$\mathcal{L}_{\mathrm{H},2} = F_\pi^2\langle\hat{\alpha}_{\perp\mu}\hat{\alpha}^\mu_\perp\rangle + F_\sigma^2\langle\hat{\alpha}_{\parallel\mu}\hat{\alpha}^\mu_\parallel\rangle - \frac{1}{2g^2}\langle V_{\mu\nu}V^{\mu\nu}\rangle + \frac{1}{4}F_\chi^2\langle\hat{\chi}_+\rangle, \tag{40}$$

where F_π and F_σ are decay constants, g is the HLS gauge coupling constant, and $\hat{\chi}_+$ is defined in terms of the scalar and pseudoscalar external sources as follows:

$$\hat{\chi}_\pm = \hat{\chi} \pm \hat{\chi}^\dagger, \quad \text{with}\ \hat{\chi} = \xi_L\chi\xi_R^\dagger. \tag{41}$$

B. Building blocks and transformation properties

The LO chiral Lagrangian comprises four essential building blocks: $\hat{\alpha}^\mu_\perp$, $\hat{\alpha}^\mu_\parallel$, $V^{\mu\nu}$, and $\hat{\chi}_+$. However, these building blocks alone are insufficient for constructing higher-order chiral Lagrangians. To address this limitation, additional terms, including $\hat{\chi}_-$, as well as the following building blocks, are required:

$$\mathcal{A}^{\mu\nu} = D^\mu\alpha^\nu_\perp - D^\nu\alpha^\mu_\perp - i[\alpha^\mu_\parallel, \alpha^\nu_\perp] - \mathrm{i}[\alpha^\mu_\perp, \alpha^\nu_\parallel], \tag{42}$$

$$\mathcal{H}^{\mu\nu} = D^\mu\alpha^\nu_\perp + D^\nu\alpha^\mu_\perp - \mathrm{i}[\alpha^\mu_\parallel, \alpha^\nu_\perp] + i[\alpha^\mu_\perp, \alpha^\nu_\parallel], \tag{43}$$

$$\mathcal{V}^{\mu\nu} = D^\mu\alpha^\nu_\parallel - D^\nu\alpha^\mu_\parallel - \mathrm{i}[\alpha^\mu_\parallel, \alpha^\nu_\parallel] - i[\alpha^\mu_\perp, \alpha^\nu_\perp] + V^{\mu\nu}, \tag{44}$$

$$H^{\mu\nu} = D^\mu\alpha^\nu_\parallel + D^\nu\alpha^\mu_\parallel. \tag{45}$$

These equations yield the symmetric and antisymmetric indices for $D^\mu\alpha^\nu_\perp$ and $D^\mu\alpha^\nu_\parallel$. At NLO, only the antisymmetric building blocks, $\mathcal{A}^{\mu\nu}$ and $\mathcal{V}^{\mu\nu}$, are present, as noted in Ref. [45]. At higher orders, the symmetric forms of $D^\mu\alpha^\nu_\perp$ and $D^\mu\alpha^\nu_\parallel$ are also required. This paper denotes these symmetric tensors as $\mathcal{H}^{\mu\nu}$ and $H^{\mu\nu}$, respectively. Additionally, an alternative set of building blocks has been proposed in the literature [46], and we adopt the former convention for consistency. Under a chiral rotation, any building block Y transforms as $Y \to hYh^\dagger$. The covariant derivative of these building blocks is given by

$$D^\mu Y = \partial^\mu Y - \mathrm{i}[K^\mu, Y]. \tag{46}$$

The structure of these building blocks in the HLS representation differs significantly from that in other representations. Generally, the relations among these building blocks are quite complex. However, the situation can be simplified in the unitary gauge, as discussed in Refs. [42, 43, 45]. Table 2 outlines the relations between Eqs. (35), (36), (41)−(45), and Eq. (6) in the unitary gauge, along with the transformation properties of the building blocks. With these building blocks and their covariant derivatives, chiral Lagrangians of any order can be constructed.

Table 2. The chiral dimension (Dim) and its relations with pseudoscalar mesonic building blocks O, as well as the properties of parity (P), charge conjugation (C), and hermiticity (h.c.) of these building blocks in the HLS representation, are discussed.

	Dim	O	P	C	h.c.
$\hat{\alpha}_\perp{}^\mu$	1	$\frac{1}{2}u^\mu$	$-\hat{\alpha}_{\perp\mu}$	$(\hat{\alpha}_\perp{}^\mu)^T$	$\hat{\alpha}_\perp{}^\mu$
$\hat{\alpha}_\parallel{}^\mu$	1		$\hat{\alpha}_{\parallel\mu}$	$-(\hat{\alpha}_\parallel{}^\mu)^T$	$\hat{\alpha}_\parallel{}^\mu$
$\hat{\chi}_\pm$	2	$\chi_\pm$	$\hat{\chi}_\pm$	$(\hat{\chi}_\pm)^T$	$\pm\hat{\chi}_\pm$
$\hat{\mathcal{V}}^{\mu\nu}$	2	$\frac{1}{2}f_+^{\mu\nu}$	$\hat{\mathcal{V}}_{\mu\nu}$	$-(\hat{\mathcal{V}}^{\mu\nu})^T$	$\hat{\mathcal{V}}^{\mu\nu}$
$V^{\mu\nu}$	2		$V_{\mu\nu}$	$-(V^{\mu\nu})^T$	$V^{\mu\nu}$
$\hat{\mathcal{H}}^{\mu\nu}$	2	$\frac{1}{2}h^{\mu\nu}$	$-\hat{\mathcal{H}}_{\mu\nu}$	$(\hat{\mathcal{H}}^{\mu\nu})^T$	$\hat{\mathcal{H}}^{\mu\nu}$
$\hat{\mathcal{A}}^{\mu\nu}$	2	$-\frac{1}{2}f_-^{\mu\nu}$	$-\hat{\mathcal{A}}_{\mu\nu}$	$(\hat{\mathcal{A}}^{\mu\nu})^T$	$\hat{\mathcal{A}}^{\mu\nu}$
$H^{\mu\nu}$	2		$H_{\mu\nu}$	$-(H^{\mu\nu})^T$	$H^{\mu\nu}$
$\varepsilon^{\mu\nu\lambda\rho}$	0		$-\varepsilon_{\mu\nu\lambda\rho}$	$\varepsilon^{\mu\nu\lambda\rho}$	$\varepsilon^{\mu\nu\lambda\rho}$

Table 2 presents the power counting of the HLS building blocks, as detailed in Refs. [42, 45]. Additionally, the parameter g in the LO chiral Lagrangian is assigned a chiral order of $O(p^1)$ [45].

C. Constraint relations

For convenience, we discuss all constraint relations in the unitary gauge. Consequently, most conclusions from Sec. III B remain applicable, provided that the relations in Table 2 are utilized. A notable difference arises in the EOMs, as detailed in Ref. [45]. The EOMs in the HLS representation are given by

$$\begin{aligned}
&D_\mu\hat{\alpha}_\perp{}^\mu = -\mathrm{i}(a-1)[\hat{\alpha}_{\parallel\mu}, \hat{\alpha}_\perp{}^\mu] - \frac{\mathrm{i}}{4}\frac{F_\chi^2}{F_\pi^2}\left(\hat{\chi}_- - \frac{1}{N_f}\langle\hat{\chi}_-\rangle\right) + O(p^4),\\
&D_\mu\hat{\alpha}_\parallel{}^\mu = O(p^4),\\
&D_\nu V^{\nu\mu} = g^2F_\sigma^2\hat{\alpha}_\parallel{}^\mu + O(p^4).
\end{aligned} \tag{47}$$

Here, the parameter a is defined as $a = F_\sigma^2/F_\pi^2$.

For $V^{\mu\nu}$, as defined in Eq. (39), a relation analogous to the Bianchi identity can be derived:

$$D^\rho V^{\mu\nu} + D^\mu V^{\nu\rho} + D^\nu V^{\rho\mu} = 0. \tag{48}$$

Thus, we have established all linear relations within the HLS representation.

VI. RESULTS OF CHIRAL LAGRANGIANS WITH VECTOR MESONS

The LO chiral Lagrangians incorporating the vector meson octet were derived over 30 years ago [36−38]. In this work, we extend the discussion to include the nonet and higher-order Lagrangians. However, these higher-order Lagrangians involve a vast number of terms, and manually performing the calculations can lead to the inadvertent omission of some linear relations. Consequently, all calculations are performed with the aid of a computer.

One major challenge in these computations is symbolic manipulation. To our knowledge, no effective and widely accessible program currently exists to automatically generate all possible terms and associated linear relations. To address this, we employ a method that converts symbolic computations into numerical ones. This paper outlines the basic approach, with detailed explanations provided in Refs. [101−103].

To avoid symbolic complications, we assign unique numbers to each building block and index. For instance, we may assign $V \to 11$, $u \to 12$, $\mu \to 1$, $\nu \to 2$, and so on. Using this scheme, a term like $V^\mu u_\mu u^\nu u_\nu$ can be represented by two vectors: one for the building blocks, $(11,12,12,12)$, and another for the indices, $(1,1,2,2)$. Compared to handling symbolic expressions, processing these vectors computationally is significantly more manageable. As a result, most of the tedious calculations are efficiently executed using this numerical approach.

A. LO

The LO chiral Lagrangians are straightforward. We provide a brief summary and incorporate the singlet state. For the vector-field representation, the independent terms are listed in Table 3. The terms involving $\langle V_\mu\rangle$, such as the fourth term in the $SU(2)$ case, include only the singlet state.

For the tensor-field representation, the independent terms are presented in Table 4. In the $SU(2)$ case, the third term includes only the singlet state.

For the HLS representation, the independent terms are presented in Table 5. Notably, the third term in both cases includes only the singlet state.

Table 3. The LO results for the vector-field representation are presented. The numbers indicate the sequence in each case.

terms	$SU(2)$	$SU(3)$
$i\langle V^\mu u^\nu f_{-\mu\nu}\rangle + \text{H.c.}$	1	1
$i\langle V^\mu u^\nu h_{\mu\nu}\rangle + \text{H.c.}$	2	2
$\langle V^\mu \nabla^\nu f_{+\mu\nu}\rangle$	3	3
$\langle V^\mu\rangle\langle \nabla^\nu f_{+\mu\nu}\rangle$	4	
$\langle V^\mu u_\mu \chi_-\rangle + \text{H.c.}$	5	4
$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu u_\lambda u_\rho\rangle$	6	5
$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle u_\nu u_\lambda u_\rho\rangle$		6
$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu f_{+\nu\lambda} u_\rho\rangle + \text{H.c.}$	7	7
$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle f_{+\nu\lambda} u_\rho\rangle$	8	8

Table 4. The LO results for the tensor-field representation. The numbers correspond to the sequence numbers in each case.

terms	$SU(2)$	$SU(3)$
$\text{i}\langle W^{\mu\nu} u_\mu u_\nu\rangle$	1	1
$\langle W^{\mu\nu} f_{+\mu\nu}\rangle$	2	2
$\langle W^{\mu\nu}\rangle\langle f_{+\mu\nu}\rangle$	3	

Table 5. The LO results for the HLS representation. The numbers correspond to the sequence numbers in each case.

terms	$SU(2)$	$SU(3)$
$\langle \hat{a}_\perp{}^\mu \hat{a}_{\perp\mu}\rangle$	1	1
$\langle \hat{a}_\parallel{}^\mu \hat{a}_{\parallel\mu}\rangle$	2	2
$\langle \hat{a}_\parallel{}^\mu\rangle\langle \hat{a}_{\parallel\mu}\rangle$	3	3
$\langle \hat{\chi}_+\rangle$	4	4

B. NLO

Because the expressions are very lengthy, the NLO result for the vector-field representation is provided in Table A1 in the supplementary material. The tensor-field and HLS representations are given in Tables 6 and 7, respectively.

The numbers of these chiral Lagrangians are presented in Table 8. Concerning the applications of these higher-order Lagrangian terms, it is theoretically possible to integrate out the vector field to connect the low-energy constants in the vector meson Lagrangian with those in the pseudoscalar meson Lagrangian. A related discussion on the vector meson octet is available in Ref. [104].

To verify our findings, we compared them with existing octet results and identified some redundant terms. The results for the octet tensor-field representation in the large-N_C limit are detailed in Ref. [63]. In the three-fla-

Table 6. The NLO chiral Lagrangians with vector mesons in the tensor-field representation.

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle W^{\mu\nu}u_\mu u_\nu u^\lambda u_\lambda\rangle+\text{H.c.}$	1	1	$\langle f_+^{\mu\nu}\rangle\langle W_{\mu\nu}\chi_+\rangle$	19	
$i\langle W^{\mu\nu}u_\mu u^\lambda u_\nu u_\lambda\rangle+\text{H.c.}$	2	2	$\langle W^{\mu\nu}f_{-\mu\nu}\chi_-\rangle+\text{H.c.}$	20	28
$i\langle W^{\mu\nu}u_\mu u^\lambda u_\lambda u_\nu\rangle$		3	$\langle W^{\mu\nu}u_\mu\nabla_\nu\chi_-\rangle+\text{H.c.}$	21	29
$i\langle W^{\mu\nu}u^\lambda u_\mu u_\nu u_\lambda\rangle$		4	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma f_{-\rho\sigma}\rangle+\text{H.c.}$	22	30
$i\langle W^{\mu\nu}\rangle\langle u_\mu u_\nu u^\lambda u_\lambda\rangle$		5	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda f_{-\rho\sigma}\rangle+\text{H.c.}$		31
$i\langle u^\mu u_\mu\rangle\langle W^{\nu\lambda}u_\nu u_\lambda\rangle$		6	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\sigma f_{-\lambda\rho}\rangle+\text{H.c.}$		32
$i\langle W^{\mu\nu}f_{-\mu}{}^\lambda f_{-\nu\lambda}\rangle$	3	7	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda f_{-\rho}{}^\sigma u_\sigma\rangle+\text{H.c.}$		33
$i\langle W^{\mu\nu}f_{-\mu}{}^\lambda h_{\nu\lambda}\rangle+\text{H.c.}$	4	8	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma h_{\rho\sigma}\rangle+\text{H.c.}$	23	34
$i\langle W^{\mu\nu}h_\mu{}^\lambda h_{\nu\lambda}\rangle$	5	9	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda h_{\rho\sigma}\rangle+\text{H.c.}$		35
$\langle W^{\mu\nu}f_{+\mu\nu}u^\lambda u_\lambda\rangle+\text{H.c.}$	6	10	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u^\sigma f_{-\rho\sigma}\rangle+\text{H.c.}$		36
$\langle W^{\mu\nu}f_{+\mu}{}^\lambda u_\nu u_\lambda\rangle+\text{H.c.}$	7	11	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u^\sigma h_{\rho\sigma}\rangle+\text{H.c.}$		37
$\langle W^{\mu\nu}f_{+\mu}{}^\lambda u_\lambda u_\nu\rangle+\text{H.c.}$	8	12	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma f_{-\rho\sigma}\rangle+\text{H.c.}$	24	38
$\langle W^{\mu\nu}u_\mu f_{+\nu}{}^\lambda u_\lambda\rangle+\text{H.c.}$	9	13	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma h_{\rho\sigma}\rangle+\text{H.c.}$	25	39
$\langle W^{\mu\nu}u^\lambda f_{+\mu\nu}u_\lambda\rangle$	10	14	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^\sigma f_{+\lambda\sigma}u_\rho\rangle+\text{H.c.}$	26	40
$\langle W^{\mu\nu}\rangle\langle f_{+\mu\nu}u^\lambda u_\lambda\rangle$	11	15	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^\sigma f_{-\rho\sigma}\rangle$	27	41
$\langle W^{\mu\nu}f_{+\mu\nu}\rangle\langle u^\lambda u_\lambda\rangle$		16	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^\sigma h_{\rho\sigma}\rangle$	28	42
$\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^\lambda u_\nu u_\lambda\rangle+\text{H.c.}$	12	17	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle\nabla^\sigma f_{+\lambda\sigma}u_\rho\rangle$	29	43
$\langle W^{\mu\nu}f_{+\mu}{}^\lambda\rangle\langle u_\nu u_\lambda\rangle$		18	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{-\lambda\rho}\chi_+\rangle+\text{H.c.}$	30	44
$\langle W^{\mu\nu}u_\mu\rangle\langle f_{+\nu}{}^\lambda u_\lambda\rangle$		19	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u_\rho\chi_-\rangle+\text{H.c.}$	31	45
$i\langle W^{\mu\nu}f_{+\mu}{}^\lambda f_{+\nu\lambda}\rangle$	13	20	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\chi_-u_\rho\rangle$	32	46
$i\langle W^{\mu\nu}u_\mu u_\nu\chi_+\rangle+\text{H.c.}$	14	21	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u_\rho\chi_-\rangle$		47
$i\langle W^{\mu\nu}u_\mu\chi_+u_\nu\rangle$	15	22	$\varepsilon^{\mu\nu\lambda\rho}\langle\chi_-\rangle\langle W_{\mu\nu}u_\lambda u_\rho\rangle$		48
$i\langle W^{\mu\nu}\rangle\langle u_\mu u_\nu\chi_+\rangle$		23	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda\rho}\chi_-\rangle+\text{H.c.}$	33	49
$i\langle\chi_+\rangle\langle W^{\mu\nu}u_\mu u_\nu\rangle$		24	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda\rho}\chi_-\rangle$	34	50
$\langle W^{\mu\nu}f_{+\mu\nu}\chi_+\rangle+\text{H.c.}$	16	25	$i\varepsilon^{\mu\nu\lambda\rho}\langle\chi_-\rangle\langle W_{\mu\nu}f_{+\lambda\rho}\rangle$	35	51
$\langle W^{\mu\nu}\rangle\langle f_{+\mu\nu}\chi_+\rangle$	17	26	$i\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu}\rangle\langle W_{\lambda\rho}\chi_-\rangle$	36	
$\langle\chi_+\rangle\langle W^{\mu\nu}f_{+\mu\nu}\rangle$	18	27			

vor case, by employing the linear relations from Sec. III B, we discovered an additional relation:

$$O_{17}^V \doteq \frac{1}{2}O_{11}^V - O_{12}^V - O_{13}^V - O_{15}^V - 2O_{16}^V, \tag{49}$$

where O_i^V denotes the i-th term listed in Table 1 of Ref. [63]. In conjunction with the relations provided in Eq. (25), three additional relations arise:

$$\begin{aligned} O_{19}^V \doteq & -2O_5^V + \frac{1}{2}O_{11}^V - O_{12}^V - O_{13}^V - O_{15}^V - 2O_{16}^V \\ & + 2O_{18}^V - \frac{1}{2}O_{20}^V, \quad O_{21}^V \doteq 0, \quad O_{22}^V \doteq 0. \end{aligned} \tag{50}$$

The terms on the left-hand side of Eqs. (49) and (50) are not independent and can be eliminated. As the large-N_c limit is not applicable in this context, it is necessary to incorporate the following terms at the $O(1/N_C)$ level into Ref. [63]:

$$\begin{aligned} & O_{23}^V = \text{i}\langle u^\mu u_\mu\rangle\langle W^{\nu\lambda}u_\nu u_\lambda\rangle, \quad O_{24}^V = \langle W^{\mu\nu}f_{+\mu\nu}\rangle\langle u^\lambda u_\lambda\rangle, \\ & O_{25}^V = \langle W^{\mu\nu}f_{+\mu}{}^\lambda\rangle\langle u_\nu u_\lambda\rangle, \quad O_{26}^V = \langle W^{\mu\nu}u_\mu\rangle\langle f_{+\nu}{}^\lambda u_\lambda\rangle, \\ & O_{27}^V = \text{i}\langle\chi_+\rangle\langle W^{\mu\nu}u_\mu u_\nu\rangle, \quad O_{28}^V = \langle\chi_+\rangle\langle W^{\mu\nu}f_{+\mu\nu}\rangle. \end{aligned} \tag{51}$$

Now, only 24 independent terms remain, denoted as O_i^V for $i = 1,2,\ldots,28$, excluding $i = 17,19,21,22$.

In the two-flavor case, only 16 terms remain, neces-

Table 7. The NLO chiral Lagrangians with vector mesons in the HLS representation.

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle \hat{a}_\perp{}^\mu \hat{a}_{\perp\mu} \hat{a}_\perp{}^\nu \hat{a}_{\perp\nu} \rangle$	1	1	$\langle \hat{a}_\perp{}^\mu \hat{a}_{\parallel\mu} \rangle \langle \hat{a}_\perp{}^\nu \hat{a}_{\parallel\nu} \rangle$		29
$\langle \hat{a}_\perp{}^\mu \hat{a}_\perp{}^\nu \hat{a}_{\perp\mu} \hat{a}_{\perp\nu} \rangle$	2	2	$\langle \hat{a}_\perp{}^\mu \hat{a}_\parallel{}^\nu \rangle \langle \hat{a}_{\perp\mu} \hat{a}_{\parallel\nu} \rangle$		30
$\langle \hat{a}_\perp{}^\mu \hat{a}_{\perp\mu} \rangle \langle \hat{a}_\perp{}^\nu \hat{a}_{\perp\nu} \rangle$		3	$\langle \hat{a}_\perp{}^\mu \hat{a}_\parallel{}^\nu \rangle \langle \hat{a}_{\perp\nu} \hat{a}_{\parallel\mu} \rangle$		31
$\mathrm{i}\langle \hat{a}_\perp{}^\mu \hat{a}_\perp{}^\nu \hat{\mathscr{V}}_{\mu\nu} \rangle$	3	4	$\mathrm{i}\langle \hat{a}_\parallel{}^\mu \hat{a}_\parallel{}^\nu \hat{\mathscr{V}}_{\mu\nu} \rangle$	25	32
$\langle \hat{\mathscr{V}}^{\mu\nu} \hat{\mathscr{V}}_{\mu\nu} \rangle$	4	5	$\langle \hat{a}_\parallel{}^\mu \hat{a}_{\parallel\mu} \hat{\chi}_+ \rangle$	26	33
$\langle \hat{\mathscr{V}}^{\mu\nu} \rangle \langle \hat{\mathscr{V}}_{\mu\nu} \rangle$	5	6	$\langle \hat{a}_\parallel{}^\mu \rangle \langle \hat{a}_{\parallel\mu} \hat{\chi}_+ \rangle$	27	34
$\langle \hat{a}_\perp{}^\mu \hat{a}_{\perp\mu} \hat{\chi}_+ \rangle$	6	7	$\langle \hat{\chi}_+ \rangle \langle \hat{a}_\parallel{}^\mu \hat{a}_{\parallel\mu} \rangle$	28	35
$\langle \hat{\chi}_+ \rangle \langle \hat{a}_\perp{}^\mu \hat{a}_{\perp\mu} \rangle$		8	$\langle \hat{a}_\parallel{}^\mu \rangle \langle \hat{a}_{\parallel\mu} \rangle \langle \hat{\chi}_+ \rangle$		36
$\langle \hat{\chi}_+^2 \rangle$	7	9	$\mathrm{i}\langle \hat{a}_\parallel{}^\mu \hat{a}_\parallel{}^\nu V_{\mu\nu} \rangle$	29	37
$\langle \hat{\chi}_+ \rangle \langle \hat{\chi}_+ \rangle$	8	10	$\langle \hat{a}_\parallel{}^\mu \hat{a}_{\parallel\mu} \hat{a}_\parallel{}^\nu \hat{a}_{\parallel\nu} \rangle$	30	38
$\langle \hat{\chi}_-^2 \rangle$	9	11	$\langle \hat{a}_\parallel{}^\mu \hat{a}_\parallel{}^\nu \hat{a}_{\parallel\mu} \hat{a}_{\parallel\nu} \rangle$	31	39
$\langle \hat{\chi}_- \rangle \langle \hat{\chi}_- \rangle$	10	12	$\langle \hat{a}_\parallel{}^\mu \rangle \langle \hat{a}_{\parallel\mu} \hat{a}_\parallel{}^\nu \hat{a}_{\parallel\nu} \rangle$	32	40
$\langle \hat{\mathscr{H}}^{\mu\nu} \hat{\mathscr{H}}_{\mu\nu} \rangle$	11	13	$\langle \hat{a}_\parallel{}^\mu \hat{a}_{\parallel\mu} \rangle \langle \hat{a}_\parallel{}^\nu \hat{a}_{\parallel\nu} \rangle$	33	41
$\mathrm{i}\langle \hat{a}_\perp{}^\mu \hat{a}_\perp{}^\nu V_{\mu\nu} \rangle$	12	14	$\langle \hat{a}_\parallel{}^\mu \hat{a}_\parallel{}^\nu \rangle \langle \hat{a}_{\parallel\mu} \hat{a}_{\parallel\nu} \rangle$	34	42
$\langle V^{\mu\nu} \hat{\mathscr{V}}_{\mu\nu} \rangle$	13	15	$\langle \hat{a}_\parallel{}^\mu \rangle \langle \hat{a}_{\parallel\mu} \rangle \langle \hat{a}_\parallel{}^\nu \hat{a}_{\parallel\nu} \rangle$		43
$\langle V^{\mu\nu} V_{\mu\nu} \rangle$	14	16	$\langle \hat{a}_\parallel{}^\mu \rangle \langle \hat{a}_\parallel{}^\nu \rangle \langle \hat{a}_{\parallel\mu} \hat{a}_{\parallel\nu} \rangle$		44
$\langle \hat{a}_\perp{}^\mu \hat{a}_{\parallel\mu} \hat{\chi}_- \rangle + \mathrm{H.c.}$	15	17	$\langle \hat{a}_\parallel{}^\mu \rangle \langle D^\nu H_{\mu\nu} \rangle$	35	45
$\mathrm{i}\langle \hat{a}_\perp{}^\mu \hat{a}_\parallel{}^\nu \hat{\mathscr{H}}_{\mu\nu} \rangle + \mathrm{H.c.}$	16	18	$\mathrm{i}\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_{\perp\nu} \hat{a}_{\perp\lambda} \hat{a}_{\parallel\rho} \rangle$	36	46
$\langle \hat{a}_\parallel{}^\mu \rangle \langle D^\nu \hat{\mathscr{V}}_{\mu\nu} \rangle$	17	19	$\mathrm{i}\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\parallel\mu} \rangle \langle \hat{a}_{\perp\nu} \hat{a}_{\perp\lambda} \hat{a}_{\perp\rho} \rangle$		47
$\langle \hat{a}_\perp{}^\mu \hat{a}_{\perp\mu} \hat{a}_\parallel{}^\nu \hat{a}_{\parallel\nu} \rangle$	18	20	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_{\parallel\nu} \hat{\mathscr{V}}_{\lambda\rho} \rangle + \mathrm{H.c.}$	37	48
$\langle \hat{a}_\perp{}^\mu \hat{a}_\perp{}^\nu \hat{a}_{\parallel\mu} \hat{a}_{\parallel\nu} \rangle$	19	21	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{\mathscr{V}}_{\mu\nu} \rangle \langle \hat{a}_{\perp\lambda} \hat{a}_{\parallel\rho} \rangle$	38	49
$\langle \hat{a}_\perp{}^\mu \hat{a}_\perp{}^\nu \hat{a}_{\parallel\nu} \hat{a}_{\parallel\mu} \rangle$	20	22	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\parallel\mu} \rangle \langle \hat{a}_{\perp\nu} \hat{\mathscr{V}}_{\lambda\rho} \rangle$		50
$\langle \hat{a}_\perp{}^\mu \hat{a}_{\parallel\mu} \hat{a}_\perp{}^\nu \hat{a}_{\parallel\nu} \rangle + \mathrm{H.c.}$	21	23	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_{\parallel\nu} V_{\lambda\rho} \rangle + \mathrm{H.c.}$	39	51
$\langle \hat{a}_\perp{}^\mu \hat{a}_\parallel{}^\nu \hat{a}_{\perp\mu} \hat{a}_{\parallel\nu} \rangle$	22	24	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\parallel\mu} \rangle \langle \hat{a}_{\perp\nu} V_{\lambda\rho} \rangle$	40	52
$\langle \hat{a}_\perp{}^\mu \hat{a}_{\perp\mu} \rangle \langle \hat{a}_\parallel{}^\nu \hat{a}_{\parallel\nu} \rangle$		25	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\parallel\mu} \rangle \langle \hat{a}_{\parallel\nu} \hat{\mathscr{A}}_{\lambda\rho} \rangle$		53
$\langle \hat{a}_\parallel{}^\mu \rangle \langle \hat{a}_\perp{}^\nu \hat{a}_{\perp\nu} \hat{a}_{\parallel\mu} \rangle$	23	26	$\mathrm{i}\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_{\parallel\nu} \hat{a}_{\parallel\lambda} \hat{a}_{\parallel\rho} \rangle$	41	54
$\langle \hat{a}_\perp{}^\mu \hat{a}_\perp{}^\nu \rangle \langle \hat{a}_{\parallel\mu} \hat{a}_{\parallel\nu} \rangle$		27	$\mathrm{i}\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\parallel\mu} \rangle \langle \hat{a}_{\perp\nu} \hat{a}_{\parallel\lambda} \hat{a}_{\parallel\rho} \rangle$		55
$\langle \hat{a}_\parallel{}^\mu \rangle \langle \hat{a}_\perp{}^\nu \hat{a}_{\perp\mu} \hat{a}_{\parallel\nu} \rangle + \mathrm{H.c.}$	24	28			

Table 8. The numbers of the NLO chiral Lagrangians with vector mesons in different representations.

Flavor	$SU(2)$			$SU(3)$		
Representation	Vector	Tensor	HLS	Vector	Tensor	HLS
Normal	81	21	35	136	29	45
Anomaly	42	15	6	95	22	10
Total	123	36	41	231	51	55

sitating the further exclusion of O_3^V, O_4^V, O_9^V, O_{23}^V, O_{24}^V, O_{25}^V, O_{26}^V, and O_{27}^V.

For the anomalous octet component, the complete results are provided in Refs. [66, 105]. By employing the linear relations from Sec. III.B and Eq. (25), three additional relations are identified:

$$O_2^{V,a} \doteq -O_1^{V,a} - O_5^{V,a} + O_7^{V,a} + O_8^{V,a}, \quad O_4^{V,a} \doteq -\frac{1}{2} O_{15}^{V,a},$$
$$O_{16}^{V,a} \doteq -\frac{1}{2} O_{11}^{V,a} + \frac{1}{2} O_{12}^{V,a}, \tag{52}$$

where $O_i^{V,a}$ denotes the i-th term in Eq. (25) of Ref. [66].

In the HLS representation for the octet, we replicate

the findings from Refs. [42, 45], with a necessary correction. Specifically, for the three-flavor normal terms, the y_{17} term from Ref. [45] is related to other terms through the Cayley-Hamilton relation (22):

$$Y_{17} = 2Y_6 + 2Y_7 + Y_8 + Y_{15} + Y_{16}, \tag{53}$$

where Y_i corresponds to the term associated with y_i. This relation arises because Eq. (22) is more general. The form used in Refs. [42, 45] is a specific case of Eq. (22). Further details are provided in Sec. 4.3 of Ref. [45].

For the three-flavor anomalous terms, some studies have presented similar results using different building blocks [41, 45, 100, 106, 107]. With these different building blocks, the results are

$$\begin{aligned}\mathcal{L}_{\mathrm{H},A,4} = \frac{N_c}{16\pi^2}\big[&c_1\,\mathrm{i}\varepsilon_{\mu\nu\rho\sigma}\langle\hat{\alpha}_L{}^{\mu}\hat{\alpha}_L{}^{\nu}\hat{\alpha}_L{}^{\rho}\hat{\alpha}_R{}^{\sigma} - \hat{\alpha}_R{}^{\mu}\hat{\alpha}_R{}^{\nu}\hat{\alpha}_R{}^{\rho}\hat{\alpha}_L{}^{\sigma}\rangle\\ &+ c_2\,\mathrm{i}\varepsilon_{\mu\nu\rho\sigma}\langle\hat{\alpha}_L{}^{\mu}\hat{\alpha}_R{}^{\nu}\hat{\alpha}_L{}^{\rho}\hat{\alpha}_R{}^{\sigma}\rangle\\ &+ c_3\,\varepsilon_{\mu\nu\rho\sigma}\langle F_V{}^{\mu\nu}(\hat{\alpha}_L{}^{\rho}\hat{\alpha}_R{}^{\sigma} - \hat{\alpha}_R{}^{\rho}\hat{\alpha}_L{}^{\sigma})\rangle\\ &+ \frac{c_4}{2}\varepsilon_{\mu\nu\rho\sigma}\langle\hat{F}_L{}^{\mu\nu}(\hat{\alpha}_L{}^{\rho}\hat{\alpha}_R{}^{\sigma} - \hat{\alpha}_R{}^{\rho}\hat{\alpha}_L{}^{\sigma})\\ &- \hat{F}_R{}^{\mu\nu}(\hat{\alpha}_R{}^{\rho}\hat{\alpha}_L{}^{\sigma} - \hat{\alpha}_L{}^{\rho}\hat{\alpha}_R{}^{\sigma})\rangle\big].\end{aligned} \tag{54}$$

With the building blocks presented in this paper, the results are

$$\begin{aligned}\mathcal{L}_{\mathrm{H},A,4} = {}&\mathcal{B}_1\,\mathrm{i}\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\alpha}_{\perp\mu}\hat{\alpha}_{\perp\nu}\hat{\alpha}_{\perp\lambda}\hat{\alpha}_{\parallel\rho}\rangle\\ &+ \mathcal{B}_2\,\varepsilon^{\mu\nu\lambda\rho}(\langle\hat{\alpha}_{\perp\mu}\hat{\alpha}_{\parallel\nu}\hat{\mathscr{V}}_{\lambda\rho}\rangle + \langle\hat{\alpha}_{\perp\mu}\hat{\mathscr{V}}_{\lambda\rho}\hat{\alpha}_{\parallel\nu}\rangle)\\ &+ \mathcal{B}_3\,\varepsilon^{\mu\nu\lambda\rho}(\langle\hat{\alpha}_{\perp\mu}\hat{\alpha}_{\parallel\nu}V_{\lambda\rho}\rangle + \langle\hat{\alpha}_{\perp\mu}V_{\lambda\rho}\hat{\alpha}_{\parallel\nu}\rangle)\\ &+ \mathcal{B}_4\,\mathrm{i}\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\alpha}_{\perp\mu}\hat{\alpha}_{\parallel\nu}\hat{\alpha}_{\parallel\lambda}\hat{\alpha}_{\parallel\rho}\rangle.\end{aligned} \tag{55}$$

These two sets of building blocks exhibit the following relations:

$$\begin{aligned}&\hat{\alpha}_L{}^{\mu} = \hat{\alpha}_{\parallel}{}^{\mu} - \hat{\alpha}_{\perp}{}^{\mu}, \quad \hat{\alpha}_R{}^{\mu} = \hat{\alpha}_{\parallel}{}^{\mu} + \hat{\alpha}_{\perp}{}^{\mu},\\ &\varepsilon_{\mu\nu\rho\sigma}F_V{}^{\mu\nu} = \frac{1}{2}\varepsilon_{\mu\nu\rho\sigma}V^{\mu\nu},\end{aligned} \tag{56}$$

$$\begin{aligned}&\varepsilon_{\mu\nu\rho\sigma}\hat{F}_L{}^{\mu\nu} = \frac{1}{2}\varepsilon_{\mu\nu\rho\sigma}(\hat{\mathscr{V}}^{\mu\nu} - \hat{\mathscr{A}}^{\mu\nu}),\\ &\varepsilon_{\mu\nu\rho\sigma}\hat{F}_R{}^{\mu\nu} = \frac{1}{2}\varepsilon_{\mu\nu\rho\sigma}(\hat{\mathscr{V}}^{\mu\nu} + \hat{\mathscr{A}}^{\mu\nu}).\end{aligned} \tag{57}$$

The relations of the LECs are

$$\mathcal{B}_1 = \frac{N_c}{16\pi^2}(-4c_1 + 4c_2), \quad \mathcal{B}_2 = -\frac{N_c}{16\pi^2}c_4,$$

$$\mathcal{B}_3 = -\frac{N_c}{16\pi^2}c_3, \quad \mathcal{B}_4 = \frac{N_c}{16\pi^2}(-4c_1 - 4c_2). \tag{58}$$

C. NNLO

The NNLO results for the chiral Lagrangians are provided in Tables A2 and A3 in the supplementary material due to their extensive length. Note that in the vector-field representation, the number of independent terms at NNLO is significantly greater than in other representations. The quantity of terms is too extensive to be included here. This underscores an advantage of the tensor-field representation, which necessitates fewer terms compared to the vector-field representation. The numbers of these chiral Lagrangians are detailed in Table 9.

VII. RELATIONS BETWEEN HLS AND TENSOR-FIELD REPRESENTATIONS

Although various representations exist for introducing vector mesons in ChPT, they are interrelated. As mentioned in the introduction, the relation between the vector-field and tensor-field representations has been previously examined. Here, we briefly discuss the connection between the HLS and tensor-field representations. While strict relations depend on multi-vector-meson vertices, we focus solely on single-vector-meson vertices in the tensor-field representation.

The relation between the HLS and tensor-field representations is established through an auxiliary field method [43]. In this approach, an additional term

$$\frac{1}{2}\kappa^2\left\langle\left(V_\mu - a_{\parallel\mu} - \frac{1}{\kappa}D^{\nu}W_{\nu\mu}\right)\left(V^{\mu} - a_{\parallel}^{\mu} - \frac{1}{\kappa}D_{\lambda}W^{\lambda\mu}\right)\right\rangle \tag{59}$$

is introduced into the chiral Lagrangian using the tensor-field representation. By integrating out the field $W^{\mu\nu}$, the Lagrangian in the HLS representation can be derived. Here, κ serves as an arbitrary parameter.

In Ref. [42], operators for four-point vertices are excluded. Incorporating these four-point vertices provides

Table 9. The numbers of the NNLO chiral Lagrangians with vector mesons in both the tensor-field and HLS representations. In the HLS representation, terms that directly correspond to those in the pseudoscalar mesonic chiral Lagrangians [7, 8] are excluded.

Flavor	$SU(2)$		$SU(3)$	
Representation	Tensor	HLS	Tensor	HLS
Normal	393	407	847	878
Anomaly	409	173	1325	493
Total	882	580	2172	1371

the complete results as

$$
\begin{aligned}
&a=\frac{\kappa^2}{2F_\pi^2}, g=\frac{\sqrt{2}M_V}{\kappa}, z_1=-\frac{(\kappa-\sqrt{2}F_V)^2}{4M_V^2},\\
&z_3=\frac{\kappa(\kappa-\sqrt{2}F_V)}{2M_V^2}, z_4=\frac{\kappa(\kappa-2\sqrt{2}G_V)}{M_V^2},\\
&z_5=-\frac{\kappa^2}{M_V^2}, z_6=-\frac{(\kappa-\sqrt{2}F_V)(\kappa-2\sqrt{2}G_V)}{M_V^2},\\
&z_7=\frac{\kappa(\kappa-\sqrt{2}F_V)}{M_V^2}, \ y_1=-y_2=-\frac{(\kappa-2\sqrt{2}G_V)^2}{2M_V^2},\\
&y_3=-y_4=-\frac{\kappa^2}{2M_V^2}, \ y_6=-y_7=-\frac{\kappa(\kappa-2\sqrt{2}G_V)}{M_V^2},
\end{aligned}
\tag{60}
$$

where F_V and G_V are the LO LECs in the tensor-field representation, while z_i and y_i are the NLO LECs in the HLS representation. To our knowledge, the y_i terms ($i=1,\ldots,7$) are not included in Ref. [43] and are introduced here for the first time. Eq. (60) demonstrates that LO terms in the tensor-field representation correspond to specific NLO terms in the HLS representation. However, extending this method to NLO in the tensor-field representation does not generate additional NLO terms in the HLS representation. This limitation arises from two factors. First, the auxiliary-field term in Eq. (59) is not unique, as it includes only a quadratic term involving vector sources. At higher orders, integrating additional terms with vector sources, and potentially other external sources, would be required—a process that becomes increasingly complex. Second, the tensor-field representation incorporates only single-vector vertices, whereas the HLS Lagrangian allows for vertices with multiple vectors. Although Eq. (60) yields some NLO terms, these are linked to the LO LECs in the tensor-field representation, making them dependent rather than independent NLO terms. Thus, for strong equivalence between the tensor-field and HLS representations to hold, the number of independent LECs should match in both representations. However, this equivalence is not evident in Eq. (60) at the NLO level. Despite this, the auxiliary-field method ensures that each term in the tensor-field representation has a corresponding term in the HLS representation.

Certain terms in the HLS representation are not derived in Eq. (60). We will discuss which terms correspond to

$$
\begin{aligned}
&\langle\hat{\alpha}_{\parallel\mu}\hat{\alpha}_\perp{}^\mu\rangle\langle\hat{\alpha}_{\parallel\nu}\hat{\alpha}_\perp{}^\nu\rangle, \quad \langle\hat{\alpha}_{\parallel\mu}\hat{\alpha}_{\parallel\nu}\rangle\langle\hat{\alpha}_\perp{}^\mu\hat{\alpha}_\perp{}^\nu\rangle,\\
&\langle(\hat{\alpha}_{\parallel\mu}\hat{\alpha}_\perp{}^\mu-\hat{\alpha}_{\perp\mu}\hat{\alpha}_\parallel{}^\mu)\hat{\chi}_-\rangle.
\end{aligned}
\tag{61}
$$

Their associated LECs are y_{14}, y_{15}, and w_5, respectively. The method closely follows that presented in Ref. [43], with the distinction that the derivation transitions from the HLS representation to the tensor-field representation. To streamline the calculation, we focus exclusively on the Lagrangian terms that encompass the kinetic term and other relevant contributions, deliberately excluding terms that do not pertain to this analysis. The resulting simplified Lagrangian is

$$
\begin{aligned}
\mathcal{L}_{\rm HLS}=&F_\sigma^2\langle\hat{\alpha}_{\parallel\mu}\hat{\alpha}_\parallel{}^\mu\rangle-\frac{1}{2g^2}\langle V_{\mu\nu}V^{\mu\nu}\rangle+y_{14}\langle\hat{\alpha}_{\parallel\mu}\hat{\alpha}_\perp{}^\mu\rangle\langle\hat{\alpha}_{\parallel\nu}\hat{\alpha}_\perp{}^\nu\rangle\\
&+y_{15}\langle\hat{\alpha}_{\parallel\mu}\hat{\alpha}_{\parallel\nu}\rangle\langle\hat{\alpha}_\perp{}^\mu\hat{\alpha}_\perp{}^\nu\rangle\\
&+w_5\langle(\hat{\alpha}_{\parallel\mu}\hat{\alpha}_\perp{}^\mu-\hat{\alpha}_\perp{}^\mu\hat{\alpha}_{\parallel\mu})\hat{\chi}_-\rangle+\cdots,
\end{aligned}
\tag{62}
$$

where "..." denotes irrelevant terms. By introducing an auxiliary field $W^{\mu\nu}$ into the Lagrangian, we obtain

$$
\mathcal{L}'_{\rm HLS}=\mathcal{L}_{\rm HLS}+\frac{1}{2g^2t^2}\langle(W_{\mu\nu}+tV_{\mu\nu})(W^{\mu\nu}+tV^{\mu\nu})\rangle, \tag{63}
$$

where t is an arbitrary parameter that does not affect the system's dynamics. By integrating out the vector field, implicitly present in K^μ within the HLS representation, we arrive at the final expression:

$$
\begin{aligned}
\mathcal{L}'_{\rm T}=&-\frac{1}{g^4t^2F_\sigma^2}\langle\nabla_\rho W^{\rho\mu}\nabla^\sigma W_{\sigma\mu}\rangle+\frac{1}{2g^2t^2}\langle W_{\mu\nu}W^{\mu\nu}\rangle\\
&+\frac{1}{2g^2t}\langle W_{\mu\nu}f_+^{\mu\nu}\rangle+\frac{1}{4g^2t}\mathrm{i}\langle W_{\mu\nu}[u^\mu,u^\nu]\rangle\\
&-\frac{w_5}{2g^2tF_\sigma^2}\langle W_{\mu\nu}\left[u^\mu,\nabla^\nu\chi_-\right]\rangle-\frac{w_5}{4g^2tF_\sigma^2}\langle W_{\mu\nu}\left[f_-^{\mu\nu},\chi_-\right]\rangle\\
&+\frac{y_{15}}{4g^4t^2F_\sigma^4}\langle u_\mu u_\nu\rangle\langle\nabla_\rho W^{\rho\mu}\nabla_\sigma W^{\sigma\nu}\rangle\\
&+\frac{y_{14}}{4g^4t^2F_\sigma^4}\langle u_\mu\nabla_\rho W^{\rho\mu}\rangle\langle u_\nu\nabla_\sigma W^{\sigma\nu}\rangle\\
&+\frac{2}{g^8t^3F_\sigma^4}\mathrm{i}\langle\nabla_\rho W^{\rho\mu}W_{\mu\nu}\nabla_\sigma W^{\sigma\nu}\rangle\\
&+\frac{w_5}{2g^4t^2F_\sigma^4}\langle\nabla_\rho W^{\rho\mu}[W_{\mu\nu},u^\nu\chi_-\chi_-u^\nu]\rangle+\cdots,
\end{aligned}
\tag{64}
$$

where "..." denotes the pseudoscalar and higher-order terms, which are not pertinent to this discussion. The initial six terms correspond to the following Lagrangian in the tensor-field representation [36, 63]:

$$
\begin{aligned}
\mathcal{L}_{\rm T}=&-\frac{1}{2}\langle\nabla_\rho W^{\rho\mu}\nabla^\sigma W_{\sigma\mu}\rangle+\frac{M_V^2}{4}\langle W_{\mu\nu}W^{\mu\nu}\rangle\\
&+\frac{1}{2\sqrt{2}}F_V\langle W_{\mu\nu}f_+^{\mu\nu}\rangle+\frac{1}{2\sqrt{2}}G_V\mathrm{i}\langle W_{\mu\nu}[u^\mu,u^\nu]\rangle\\
&+D_{10}\langle W_{\mu\nu}\left[u^\mu,\nabla^\nu\chi_-\right]\rangle+D_{20}\langle W_{\mu\nu}\left[f_-^{\mu\nu},\chi_-\right]\rangle,
\end{aligned}
\tag{65}
$$

where D_{10} and D_{20} represent the NLO LECs in the tensor-field representation (refer to Table 1 in Ref. [63]).

By comparing Eqs. (64) and (65), the following relations are derived:

$$t=\frac{\sqrt{2}}{g^2F_\sigma},\quad M_V=gF_\sigma,\quad F_V=F_\sigma,\quad G_V=\frac{F_\sigma}{2}. \tag{66}$$

These relations are consistent with those found in Refs. [36, 43]. The KSRF I relation, $F_V=2G_V$, is also derived from these. In Eq. (64), y_{14} and y_{15} are linked to $\langle u_\mu\nabla_\rho W^{\rho\mu}\rangle\langle u_\nu\nabla_\sigma W^{\sigma\nu}\rangle$ and $\langle u_\mu u_\nu\rangle\langle\nabla_\rho W^{\rho\mu}\nabla_\sigma W^{\sigma\nu}\rangle$, respectively, indicating that these terms correspond to two-vector vertices. The term w_5 is associated with $\langle W_{\mu\nu}\left[u^\mu,\nabla^\nu\chi_-\right]\rangle$, $\langle W_{\mu\nu}\left[f_-^{\mu\nu},\chi_-\right]\rangle$, and $\langle\nabla_\rho W^{\rho\mu}[W_{\mu\nu},u^\nu\chi_--\chi_-u^\nu]\rangle$. Notably, the last term also involves two-vector vertices. Thus, the w_5 term incorporates both one- and two-vector vertices. This observation implies that a single term in the HLS representation may correspond to multiple terms in the tensor-field representation, potentially involving varying numbers of vector fields. This example highlights that certain terms in the HLS representation are associated with multi-vector vertices in the tensor-field representation. This conclusion is evident from the HLS Lagrangian, as one $\hat{a}_\parallel$ corresponds to one vector field. Therefore, achieving full equivalence requires considering all possible numbers of vector vertices, and this remains a challenging task at present.

VIII. CONCLUSIONS AND DISCUSSIONS

In this work, chiral Lagrangians with a vector meson nonet are constructed to the NLO in the vector-field representation, as well as to the NNLO in the tensor-field and HLS representations, considering both the normal and anomalous components. Additional constraint conditions for the octet are derived in the tensor-field and HLS representations at the NLO. With these new constraints, we identify that some terms in the literature are not linearly independent and should be removed. Finally, we discuss the equivalence between the HLS and tensor-field representations. Achieving full equivalence requires consideration of all numbers of vector vertices.

Here, we consider only single-vector vertices, while chiral effective Lagrangians involving two or more vector fields could be more insightful for investigating vector meson masses, vector-vector meson interactions, electromagnetic properties, and related phenomena. Extending our discussion to these cases is intriguing but beyond the scope of this paper and will be explored in future research.

From the above results, it is evident that different representations contain distinct terms and LECs. The equivalence has been reviewed in the introduction. One could adopt any preferred representation. For example, Ref. [36] calculated the electromagnetic form factor of the pion in both vector-field and tensor-field representations. Although the vector-field representation yields more LECs, both representations provide equivalent results. A one-to-one correspondence between LECs in different representations is generally absent, as discussed below Eq. (66). In practice, different representations can be combined in a single problem. For instance, the tensor-field representation for vector mesons and the vector-field representation for J/ψ are chosen in Refs. [79–81], where J/ψ is regarded as a vector meson singlet. To avoid complications, a representation with fewer LECs at a given order should simplify the calculation.

Although higher-order chiral Lagrangians contain numerous terms, only a subset is relevant for specific problems. For instance, when studying pseudoscalar mesons using the vector mesonic chiral Lagrangian, only a few terms are significant, as discussed in Ref. [104]. Currently, some complex computations can be efficiently managed using computer algebra systems, making tedious mathematical calculations more manageable. The higher-order contributions to the properties of vector mesons, such as their masses, electromagnetic properties, and interactions with pseudoscalar mesons, can be studied.

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APPENDIX

This appendix provides the explicit form of the chiral Lagrangians for vector mesons at next-toleading order (NLO) and next-to-next-to-leading order (NNLO) in different representations.

A. THE NLO CHIRAL LAGRANGIANS IN VECTOR-FIELD REPRESENTATION

Table A1. The NLO chiral Lagrangians with vector mesons in the vector-field representation.

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle V^\mu u_\mu u^\nu u^\lambda f_{-\nu\lambda}\rangle+\text{H.c.}$	1	1	$\langle V^\mu u_\mu u^\nu\chi_-u_\nu\rangle+\text{H.c.}$		117
$i\langle V^\mu u^\nu u_\mu u^\lambda f_{-\nu\lambda}\rangle+\text{H.c.}$	2	2	$\langle V^\mu u^\nu u_\mu\chi_-u_\nu\rangle+\text{H.c.}$		118

Continued on next page

Table A1-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle V^\mu u^\nu u_\nu u^\lambda f_{-\mu\lambda}\rangle+\text{H.c.}$	3	3	$\langle V^\mu\rangle\langle u_\mu u^\nu u_\nu\chi_-\rangle+\text{H.c.}$		119
$i\langle V^\mu u^\nu u^\lambda u_\mu f_{-\nu\lambda}\rangle+\text{H.c.}$		4	$\langle u^\mu\chi_-\rangle\langle V^\nu u_\nu u_\mu\rangle+\text{H.c.}$		120
$i\langle V^\mu u^\nu u^\lambda u_\nu f_{-\mu\lambda}\rangle+\text{H.c.}$	4	5	$\langle\chi_-\rangle\langle V^\mu u_\mu u^\nu u_\nu\rangle+\text{H.c.}$		121
$i\langle V^\mu u^\nu u^\lambda u_\lambda f_{-\mu\nu}\rangle+\text{H.c.}$		6	$\langle V^\mu\nabla^\nu f_{-\mu\nu}\chi_-\rangle+\text{H.c.}$	72	122
$i\langle V^\mu u_\mu u^\nu f_{-\nu}{}^\lambda u_\lambda\rangle+\text{H.c.}$	5	7	$i\langle V^\mu f_{+\mu}{}^\nu u_\nu\chi_-\rangle+\text{H.c.}$	73	123
$i\langle V^\mu u^\nu u_\mu f_{-\nu}{}^\lambda u_\lambda\rangle+\text{H.c.}$		8	$i\langle V^\mu f_{+\mu}{}^\nu\chi_- u_\nu\rangle+\text{H.c.}$	74	124
$i\langle V^\mu u^\nu u_\nu f_{-\mu}{}^\lambda u_\lambda\rangle+\text{H.c.}$		9	$i\langle V^\mu u^\nu f_{+\mu\nu}\chi_-\rangle+\text{H.c.}$	75	125
$i\langle V^\mu u^\nu u^\lambda f_{-\mu\nu}u_\lambda\rangle+\text{H.c.}$	6	10	$i\langle V^\mu\rangle\langle f_{+\mu}{}^\nu u_\nu\chi_-\rangle+\text{H.c.}$	76	126
$i\langle V^\mu u^\nu u^\lambda f_{-\mu\lambda}u_\nu\rangle+\text{H.c.}$		11	$i\langle V^\mu f_{+\mu}{}^\nu\rangle\langle u_\nu\chi_-\rangle$	77	127
$i\langle V^\mu u^\nu u^\lambda f_{-\nu\lambda}u_\mu\rangle+\text{H.c.}$		12	$i\langle f_+{}^{\mu\nu}\rangle\langle V_\mu u_\nu\chi_-\rangle+\text{H.c.}$	78	
$i\langle V^\mu u_\mu u^\nu u^\lambda h_{\nu\lambda}\rangle+\text{H.c.}$	7	13	$i\langle\chi_-\rangle\langle V^\mu f_{+\mu}{}^\nu u_\nu\rangle+\text{H.c.}$		128
$i\langle V^\mu u^\nu u_\mu u^\lambda h_{\nu\lambda}\rangle+\text{H.c.}$	8	14	$i\langle V^\mu u^\nu\rangle\langle f_{+\mu\nu}\chi_-\rangle$		129
$i\langle V^\mu u^\nu u_\nu u^\lambda h_{\mu\lambda}\rangle+\text{H.c.}$	9	15	$i\langle V^\mu\chi_-\rangle\langle f_{+\mu}{}^\nu u_\nu\rangle$		130
$i\langle V^\mu u^\nu u^\lambda u_\mu h_{\nu\lambda}\rangle+\text{H.c.}$		16	$\langle V^\mu u_\mu\chi_+\chi_-\rangle+\text{H.c.}$	79	131
$i\langle V^\mu u^\nu u^\lambda u_\nu h_{\mu\lambda}\rangle+\text{H.c.}$	10	17	$\langle V^\mu u_\mu\chi_-\chi_+\rangle+\text{H.c.}$	80	132
$i\langle V^\mu u^\nu u^\lambda u_\lambda h_{\mu\nu}\rangle+\text{H.c.}$		18	$\langle V^\mu\chi_+u_\mu\chi_-\rangle+\text{H.c.}$	81	133
$i\langle V^\mu u_\mu u^\nu h_\nu{}^\lambda u_\lambda\rangle+\text{H.c.}$	11	19	$\langle V^\mu\rangle\langle u_\mu\chi_+\chi_-\rangle+\text{H.c.}$		134
$i\langle V^\mu u^\nu u_\mu h_\nu{}^\lambda u_\lambda\rangle+\text{H.c.}$		20	$\langle\chi_-\rangle\langle V^\mu u_\mu\chi_+\rangle+\text{H.c.}$		135
$i\langle V^\mu u^\nu u_\nu h_\mu{}^\lambda u_\lambda\rangle+\text{H.c.}$		21	$\langle\chi_+\rangle\langle V^\mu u_\mu\chi_-\rangle+\text{H.c.}$		136
$i\langle V^\mu u^\nu u^\lambda h_{\mu\nu}u_\lambda\rangle+\text{H.c.}$	12	22	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu u_\lambda u_\rho u^\sigma u_\sigma\rangle+\text{H.c.}$	82	137
$i\langle V^\mu u^\nu u^\lambda h_{\mu\lambda}u_\nu\rangle+\text{H.c.}$		23	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu u_\lambda u^\sigma u_\rho u_\sigma\rangle+\text{H.c.}$		138
$i\langle V^\mu u^\nu u^\lambda h_{\nu\lambda}u_\mu\rangle+\text{H.c.}$		24	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu u_\lambda u^\sigma u_\sigma u_\rho\rangle+\text{H.c.}$		139
$i\langle V^\mu\rangle\langle u_\mu u^\nu u^\lambda f_{-\nu\lambda}\rangle+\text{H.c.}$		25	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu u^\sigma u_\lambda u_\rho u_\sigma\rangle+\text{H.c.}$		140
$i\langle V^\mu u_\mu\rangle\langle u^\nu u^\lambda f_{-\nu\lambda}\rangle$		26	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu u^\sigma u_\lambda u_\sigma u_\rho\rangle$		141
$i\langle u^\mu f_{-\mu}{}^\nu\rangle\langle V^\lambda u_\lambda u_\nu\rangle+\text{H.c.}$		27	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u^\sigma u_\nu u_\lambda u_\rho u_\sigma\rangle$		142
$i\langle V^\mu\rangle\langle u^\nu u_\mu u^\lambda f_{-\nu\lambda}\rangle$		28	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle u_\nu u_\lambda u_\rho u^\sigma u_\sigma\rangle$		143
$i\langle V^\mu u^\nu\rangle\langle u_\mu u^\lambda f_{-\nu\lambda}\rangle+\text{H.c.}$		29	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu\rangle\langle u_\lambda u_\rho u^\sigma u_\sigma\rangle$		144
$i\langle V^\mu\rangle\langle u^\nu u_\nu u^\lambda f_{-\mu\lambda}\rangle+\text{H.c.}$		30	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu u_\lambda\rangle\langle u_\rho u^\sigma u_\sigma\rangle$		145
$i\langle V^\mu u^\nu\rangle\langle u_\nu u^\lambda f_{-\mu\lambda}\rangle+\text{H.c.}$		31	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u_\sigma\rangle\langle V_\mu u_\nu u_\lambda u_\rho\rangle$		146
$i\langle V^\mu\rangle\langle u_\mu u^\nu u^\lambda h_{\nu\lambda}\rangle+\text{H.c.}$		32	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle u_\nu u_\lambda u^\sigma u_\rho u_\sigma\rangle$		147
$i\langle u^\mu h_\mu{}^\nu\rangle\langle V^\lambda u_\lambda u_\nu\rangle+\text{H.c.}$		33	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu f_{-\lambda}{}^\sigma f_{-\rho\sigma}\rangle+\text{H.c.}$	83	148
$i\langle V^\mu\rangle\langle u^\nu u_\nu u^\lambda h_{\mu\lambda}\rangle+\text{H.c.}$		34	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u^\sigma f_{-\nu\lambda}f_{-\rho\sigma}\rangle+\text{H.c.}$	84	149
$i\langle V^\mu u^\nu\rangle\langle u_\nu u^\lambda h_{\mu\lambda}\rangle+\text{H.c.}$		35	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u^\sigma f_{-\nu\sigma}f_{-\lambda\rho}\rangle+\text{H.c.}$		150
$i\langle V^\mu f_{-\mu}{}^\nu\nabla^\lambda f_{-\nu\lambda}\rangle+\text{H.c.}$	13	36	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu f_{-\nu\lambda}u^\sigma f_{-\rho\sigma}\rangle+\text{H.c.}$		151
$i\langle V^\mu f_-{}^{\nu\lambda}\nabla_\mu f_{-\nu\lambda}\rangle+\text{H.c.}$	14	37	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu f_{-\nu}{}^\sigma u_\lambda f_{-\rho\sigma}\rangle$		152
$i\langle V^\mu f_-{}^{\nu\lambda}\nabla_\nu f_{-\mu\lambda}\rangle+\text{H.c.}$	15	38	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu f_{-\lambda}{}^\sigma h_{\rho\sigma}\rangle+\text{H.c.}$	85	153
$i\langle V^\mu\nabla^\nu f_{-\mu}{}^\lambda h_{\nu\lambda}\rangle+\text{H.c.}$	16	39	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u^\sigma f_{-\nu\lambda}h_{\rho\sigma}\rangle+\text{H.c.}$	86	154

Continued on next page

Table A1-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle V^\mu\nabla^\nu f_{-\nu}{}^\lambda h_{\mu\lambda}\rangle+\text{H.c.}$	17	40	$i\varepsilon^{\mu\nu\lambda\rho}\langle V^\sigma u_\mu f_{-\nu\lambda}h_{\rho\sigma}\rangle+\text{H.c.}$	87	155
$i\langle V^\mu f_{-\mu}{}^\nu\nabla^\lambda h_{\nu\lambda}\rangle+\text{H.c.}$	18	41	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu h_\lambda{}^\sigma f_{-\rho\sigma}\rangle+\text{H.c.}$		156
$i\langle V^\mu f_-{}^{\nu\lambda}\nabla_\nu h_{\mu\lambda}\rangle+\text{H.c.}$	19	42	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u^\sigma h_{\nu\sigma}f_{-\lambda\rho}\rangle+\text{H.c.}$		157
$i\langle V^\mu h_\mu{}^\nu\nabla^\lambda h_{\nu\lambda}\rangle+\text{H.c.}$	20	43	$i\varepsilon^{\mu\nu\lambda\rho}\langle V^\sigma u_\mu h_{\nu\sigma}f_{-\lambda\rho}\rangle+\text{H.c.}$		158
$i\langle V^\mu h^{\nu\lambda}\nabla_\mu h_{\nu\lambda}\rangle+\text{H.c.}$	21	44	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu f_{-\nu\lambda}u^\sigma h_{\rho\sigma}\rangle+\text{H.c.}$		159
$i\langle V^\mu h^{\nu\lambda}\nabla_\nu h_{\mu\lambda}\rangle+\text{H.c.}$	22	45	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu f_{-\nu}{}^\sigma u_\lambda h_{\rho\sigma}\rangle+\text{H.c.}$		160
$i\langle V^\mu u^\nu\nabla_\nu\nabla^\lambda f_{-\mu\lambda}\rangle+\text{H.c.}$	23	46	$i\varepsilon^{\mu\nu\lambda\rho}\langle V^\sigma f_{-\mu\nu}u_\lambda h_{\rho\sigma}\rangle+\text{H.c.}$		161
$i\langle V^\mu u_\mu\nabla^\nu\nabla^\lambda h_{\nu\lambda}\rangle+\text{H.c.}$	24	47	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu h_\lambda{}^\sigma h_{\rho\sigma}\rangle+\text{H.c.}$	88	162
$i\langle V^\mu u^\nu\nabla_\nu\nabla^\lambda h_{\mu\lambda}\rangle+\text{H.c.}$	25	48	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu h_\nu{}^\sigma u_\lambda h_{\rho\sigma}\rangle$		163
$\langle V^\mu f_{+\mu}{}^\nu u^\lambda f_{-\nu\lambda}\rangle+\text{H.c.}$	26	49	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu u_\lambda\nabla^\sigma f_{-\rho\sigma}\rangle+\text{H.c.}$	89	164
$\langle V^\mu f_+{}^{\nu\lambda}u_\mu f_{-\nu\lambda}\rangle+\text{H.c.}$	27	50	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu u^\sigma\nabla_\lambda f_{-\rho\sigma}\rangle+\text{H.c.}$	90	165
$\langle V^\mu f_+{}^{\nu\lambda}u_\nu f_{-\mu\lambda}\rangle+\text{H.c.}$	28	51	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu u^\sigma\nabla_\sigma f_{-\lambda\rho}\rangle+\text{H.c.}$		166
$\langle V^\mu f_{+\mu}{}^\nu f_{-\nu}{}^\lambda u_\lambda\rangle+\text{H.c.}$	29	52	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u^\sigma u_\nu\nabla_\lambda f_{-\rho\sigma}\rangle+\text{H.c.}$		167
$\langle V^\mu f_+{}^{\nu\lambda}f_{-\mu\nu}u_\lambda\rangle+\text{H.c.}$	30	53	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u^\sigma u_\sigma\nabla_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$		168
$\langle V^\mu f_+{}^{\nu\lambda}f_{-\nu\lambda}u_\mu\rangle+\text{H.c.}$	31	54	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu\nabla_\lambda f_{-\rho}{}^\sigma u_\sigma\rangle+\text{H.c.}$		169
$\langle V^\mu u^\nu f_{+\nu}{}^\lambda f_{-\mu\lambda}\rangle+\text{H.c.}$	32	55	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu\nabla^\sigma f_{-\lambda\rho}u_\sigma\rangle+\text{H.c.}$		170
$\langle V^\mu f_{+\mu}{}^\nu u^\lambda h_{\nu\lambda}\rangle+\text{H.c.}$	33	56	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu u_\lambda\nabla^\sigma h_{\rho\sigma}\rangle+\text{H.c.}$		171
$\langle V^\mu f_+{}^{\nu\lambda}u_\nu h_{\mu\lambda}\rangle+\text{H.c.}$	34	57	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu u^\sigma\nabla_\lambda h_{\rho\sigma}\rangle+\text{H.c.}$	91	172
$\langle V^\mu f_{+\mu}{}^\nu h_\nu{}^\lambda u_\lambda\rangle+\text{H.c.}$	35	58	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u^\sigma u_\nu\nabla_\lambda h_{\rho\sigma}\rangle+\text{H.c.}$		173
$\langle V^\mu f_+{}^{\nu\lambda}h_{\mu\nu}u_\lambda\rangle+\text{H.c.}$	36	59	$i\varepsilon^{\mu\nu\lambda\rho}\langle V^\sigma u_\mu u_\nu\nabla_\lambda h_{\rho\sigma}\rangle+\text{H.c.}$		174
$\langle V^\mu u^\nu f_{+\nu}{}^\lambda h_{\mu\lambda}\rangle+\text{H.c.}$	37	60	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu\nabla_\lambda h_\rho{}^\sigma u_\sigma\rangle+\text{H.c.}$		175
$\langle V^\mu\nabla^\nu f_{+\mu\nu}u^\lambda u_\lambda\rangle+\text{H.c.}$	38	61	$i\varepsilon^{\mu\nu\lambda\rho}\langle V^\sigma u_\mu\nabla_\nu h_{\lambda\sigma}u_\rho\rangle$		176
$\langle V^\mu\nabla^\nu f_{+\mu}{}^\lambda u_\nu u_\lambda\rangle+\text{H.c.}$	39	62	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle u_\nu f_{-\lambda}{}^\sigma f_{-\rho\sigma}\rangle$		177
$\langle V^\mu\nabla^\nu f_{+\nu}{}^\lambda u_\mu u_\lambda\rangle+\text{H.c.}$	40	63	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle u^\sigma f_{-\nu\lambda}f_{-\rho\sigma}\rangle+\text{H.c.}$		178
$\langle V^\mu\nabla^\nu f_{+\nu}{}^\lambda u_\lambda u_\mu\rangle+\text{H.c.}$	41	64	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle u_\nu f_{-\lambda}{}^\sigma h_{\rho\sigma}\rangle+\text{H.c.}$		179
$\langle V^\mu u_\mu\nabla^\nu f_{+\nu}{}^\lambda u_\lambda\rangle+\text{H.c.}$	42	65	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle u^\sigma f_{-\nu\lambda}h_{\rho\sigma}\rangle+\text{H.c.}$		180
$\langle V^\mu u^\nu\nabla_\nu f_{+\mu}{}^\lambda u_\lambda\rangle+\text{H.c.}$	43	66	$i\varepsilon^{\mu\nu\lambda\rho}\langle V^\sigma\rangle\langle u_\mu f_{-\nu\lambda}h_{\rho\sigma}\rangle+\text{H.c.}$		181
$\langle V^\mu u^\nu\nabla^\lambda f_{+\mu\lambda}u_\nu\rangle$	44	67	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle u_\nu h_\lambda{}^\sigma h_{\rho\sigma}\rangle$		182
$\langle V^\mu\rangle\langle f_{+\mu}{}^\nu u^\lambda f_{-\nu\lambda}\rangle+\text{H.c.}$	45	68	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle u_\nu u_\lambda\nabla^\sigma f_{-\rho\sigma}\rangle$		183
$\langle V^\mu f_{+\mu}{}^\nu\rangle\langle u^\lambda f_{-\nu\lambda}\rangle$		69	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle u_\nu u^\sigma\nabla_\lambda f_{-\rho\sigma}\rangle+\text{H.c.}$		184
$\langle V^\mu\rangle\langle f_+{}^{\nu\lambda}u_\mu f_{-\nu\lambda}\rangle+\text{H.c.}$	46	70	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle u_\nu u^\sigma\nabla_\lambda h_{\rho\sigma}\rangle+\text{H.c.}$		185
$\langle V^\mu f_+{}^{\nu\lambda}\rangle\langle u_\mu f_{-\nu\lambda}\rangle$		71	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu f_{+\nu\lambda}u_\rho u^\sigma u_\sigma\rangle+\text{H.c.}$	92	186
$\langle V^\mu\rangle\langle f_+{}^{\nu\lambda}u_\nu f_{-\mu\lambda}\rangle+\text{H.c.}$	47	72	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu f_{+\nu\lambda}u^\sigma u_\rho u_\sigma\rangle+\text{H.c.}$	93	187
$\langle V^\mu f_+{}^{\nu\lambda}\rangle\langle u_\nu f_{-\mu\lambda}\rangle$		73	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu f_{+\nu}{}^\sigma u_\lambda u_\rho u_\sigma\rangle+\text{H.c.}$	94	188
$\langle V^\mu u_\mu\rangle\langle f_+{}^{\nu\lambda}f_{-\nu\lambda}\rangle$		74	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle f_{+\nu\lambda}u_\rho u^\sigma u_\sigma\rangle+\text{H.c.}$	95	189
$\langle V^\mu u^\nu\rangle\langle f_{+\mu}{}^\lambda f_{-\nu\lambda}\rangle$		75	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu f_{+\nu\lambda}\rangle\langle u_\rho u^\sigma u_\sigma\rangle$		190
$\langle V^\mu u^\nu\rangle\langle f_{+\nu}{}^\lambda f_{-\mu\lambda}\rangle$		76	$\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u_\sigma\rangle\langle V_\mu f_{+\nu\lambda}u_\rho\rangle+\text{H.c.}$		191

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Table A1-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle V^\mu\rangle\langle f_{+\mu}{}^\nu u^\lambda h_{\nu\lambda}\rangle+\text{H.c.}$	48	77	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle V_\nu f_{+\lambda\sigma}u_\rho\rangle+\text{H.c.}$		192
$\langle V^\mu f_{+\mu}{}^\nu\rangle\langle u^\lambda h_{\nu\lambda}\rangle$		78	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu\rangle\langle f_{+\lambda\rho}u^\sigma u_\sigma\rangle$		193
$\langle V^\mu\rangle\langle f_+{}^{\nu\lambda}u_\nu h_{\mu\lambda}\rangle+\text{H.c.}$	49	79	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu\rangle\langle f_{+\lambda}{}^\sigma u_\rho u_\sigma\rangle+\text{H.c.}$		194
$\langle V^\mu f_+{}^{\nu\lambda}\rangle\langle u_\nu h_{\mu\lambda}\rangle$		80	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u^\sigma\rangle\langle f_{+\nu\lambda}u_\rho u_\sigma\rangle+\text{H.c.}$		195
$\langle V^\mu u^\nu\rangle\langle f_{+\mu}{}^\lambda h_{\nu\lambda}\rangle$		81	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\nabla_\nu f_{+\lambda}{}^\sigma f_{-\rho\sigma}\rangle+\text{H.c.}$	96	196
$\langle V^\mu u^\nu\rangle\langle f_{+\nu}{}^\lambda h_{\mu\lambda}\rangle$		82	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\nabla^\sigma f_{+\nu\sigma}f_{-\lambda\rho}\rangle+\text{H.c.}$	97	197
$\langle V^\mu\rangle\langle\nabla^\nu f_{+\mu\nu}u^\lambda u_\lambda\rangle$	50	83	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\nabla_\nu f_{+\lambda}{}^\sigma h_{\rho\sigma}\rangle+\text{H.c.}$	98	198
$\langle V^\mu\nabla^\nu f_{+\mu\nu}\rangle\langle u^\lambda u_\lambda\rangle$		84	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu f_{+\nu\lambda}\nabla^\sigma f_{-\rho\sigma}\rangle+\text{H.c.}$	99	199
$\langle V^\mu\rangle\langle\nabla^\nu f_{+\mu}{}^\lambda u_\nu u_\lambda\rangle+\text{H.c.}$	51	85	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu f_{+\nu}{}^\sigma\nabla_\lambda f_{-\rho\sigma}\rangle+\text{H.c.}$	100	200
$\langle V^\mu\nabla^\nu f_{+\mu}{}^\lambda\rangle\langle u_\nu u_\lambda\rangle$		86	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu f_{+\nu\lambda}\nabla^\sigma h_{\rho\sigma}\rangle+\text{H.c.}$	101	201
$\langle V^\mu\rangle\langle\nabla^\nu f_{+\nu}{}^\lambda u_\mu u_\lambda\rangle+\text{H.c.}$	52	87	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu f_{+\nu}{}^\sigma\nabla_\lambda h_{\rho\sigma}\rangle+\text{H.c.}$	102	202
$\langle V^\mu\nabla^\nu f_{+\nu}{}^\lambda\rangle\langle u_\mu u_\lambda\rangle$		88	$\varepsilon^{\mu\nu\lambda\rho}\langle V^\sigma f_{+\mu\nu}\nabla_\lambda h_{\rho\sigma}\rangle+\text{H.c.}$	103	203
$\langle V^\mu u_\mu\rangle\langle\nabla^\nu f_{+\nu}{}^\lambda u_\lambda\rangle$		89	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\nabla_\nu\nabla^\sigma f_{+\lambda\rho}u_\sigma\rangle+\text{H.c.}$	104	204
$i\langle V^\mu f_{+\mu}{}^\nu\nabla^\lambda f_{+\nu\lambda}\rangle+\text{H.c.}$	53	90	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\nabla_\nu\nabla^\sigma f_{+\lambda\sigma}u_\rho\rangle+\text{H.c.}$	105	205
$i\langle V^\mu f_+{}^{\nu\lambda}\nabla_\mu f_{+\nu\lambda}\rangle+\text{H.c.}$	54	91	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle\nabla_\nu f_{+\lambda}{}^\sigma f_{-\rho\sigma}\rangle$	106	206
$i\langle V^\mu u^\nu f_{-\mu\nu}\chi_+\rangle+\text{H.c.}$	55	92	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle\nabla^\sigma f_{+\nu\sigma}f_{-\lambda\rho}\rangle$	107	207
$i\langle V^\mu u^\nu\chi_+ f_{-\mu\nu}\rangle+\text{H.c.}$	56	93	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle\nabla_\nu f_{+\lambda}{}^\sigma h_{\rho\sigma}\rangle$	108	208
$i\langle V^\mu f_{-\mu}{}^\nu u_\nu\chi_+\rangle+\text{H.c.}$		94	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle f_{+\nu\lambda}\nabla^\sigma f_{-\rho\sigma}\rangle$	109	209
$i\langle V^\mu u^\nu h_{\mu\nu}\chi_+\rangle+\text{H.c.}$	57	95	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle f_{+\nu}{}^\sigma\nabla_\lambda f_{-\rho\sigma}\rangle$		210
$i\langle V^\mu u^\nu\chi_+ h_{\mu\nu}\rangle+\text{H.c.}$	58	96	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle f_{+\nu\lambda}\nabla^\sigma h_{\rho\sigma}\rangle$	110	211
$i\langle V^\mu h_\mu{}^\nu u_\nu\chi_+\rangle+\text{H.c.}$		97	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle f_{+\nu}{}^\sigma\nabla_\lambda h_{\rho\sigma}\rangle$		212
$i\langle V^\mu u_\mu u^\nu\nabla_\nu\chi_+\rangle+\text{H.c.}$	59	98	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu u_\lambda u_\rho\chi_+\rangle+\text{H.c.}$	111	213
$i\langle V^\mu u^\nu u_\mu\nabla_\nu\chi_+\rangle+\text{H.c.}$		99	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu u_\lambda\chi_+ u_\rho\rangle+\text{H.c.}$	112	214
$i\langle V^\mu u_\mu\nabla^\nu\chi_+ u_\nu\rangle+\text{H.c.}$	60	100	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle u_\nu u_\lambda u_\rho\chi_+\rangle$		215
$i\langle V^\mu\rangle\langle u^\nu f_{-\mu\nu}\chi_+\rangle+\text{H.c.}$		101	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu\rangle\langle u_\lambda u_\rho\chi_+\rangle$		216
$i\langle\chi_+\rangle\langle V^\mu u^\nu f_{-\mu\nu}\rangle+\text{H.c.}$		102	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu\chi_+\rangle\langle V_\nu u_\lambda u_\rho\rangle$		217
$i\langle V^\mu\rangle\langle u^\nu h_{\mu\nu}\chi_+\rangle+\text{H.c.}$		103	$i\varepsilon^{\mu\nu\lambda\rho}\langle\chi_+\rangle\langle V_\mu u_\nu u_\lambda u_\rho\rangle$		218
$i\langle\chi_+\rangle\langle V^\mu u^\nu h_{\mu\nu}\rangle+\text{H.c.}$		104	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\chi_+\rangle\langle u_\nu u_\lambda u_\rho\rangle$		219
$i\langle V^\mu\rangle\langle u_\mu u^\nu\nabla_\nu\chi_+\rangle+\text{H.c.}$		105	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\nabla_\nu f_{-\lambda\rho}\chi_+\rangle+\text{H.c.}$	113	220
$i\langle\nabla^\mu\chi_+\rangle\langle V^\nu u_\nu u_\mu\rangle+\text{H.c.}$		106	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu f_{-\nu\lambda}\nabla_\rho\chi_+\rangle+\text{H.c.}$	114	221
$\langle V^\mu\nabla^\nu f_{+\mu\nu}\chi_+\rangle+\text{H.c.}$	61	107	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu f_{+\nu\lambda}u_\rho\chi_+\rangle+\text{H.c.}$	115	222
$\langle V^\mu f_{+\mu}{}^\nu\nabla_\nu\chi_+\rangle+\text{H.c.}$	62	108	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu f_{+\nu\lambda}\chi_+ u_\rho\rangle+\text{H.c.}$	116	223
$\langle V^\mu\rangle\langle\nabla^\nu f_{+\mu\nu}\chi_+\rangle$	63	109	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle f_{+\nu\lambda}u_\rho\chi_+\rangle+\text{H.c.}$	117	224
$\langle\chi_+\rangle\langle V^\mu\nabla^\nu f_{+\mu\nu}\rangle$	64	110	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu f_{+\nu\lambda}\rangle\langle u_\rho\chi_+\rangle$	118	225
$\langle\nabla^\mu f_{+\mu}{}^\nu\rangle\langle V_\nu\chi_+\rangle$	65		$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu}\rangle\langle V_\lambda u_\rho\chi_+\rangle+\text{H.c.}$	119	
$\langle V^\mu\rangle\langle f_{+\mu}{}^\nu\nabla_\nu\chi_+\rangle$	66	111	$\varepsilon^{\mu\nu\lambda\rho}\langle\chi_+\rangle\langle V_\mu f_{+\nu\lambda}u_\rho\rangle+\text{H.c.}$		226
$\langle\nabla^\mu\chi_+\rangle\langle V^\nu f_{+\mu\nu}\rangle$	67	112	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu\rangle\langle f_{+\lambda\rho}\chi_+\rangle$		227

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Table A1-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle f_+^{\mu\nu}\rangle\langle V_\mu\nabla_\nu\chi_+\rangle$	68		$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\chi_+\rangle\langle f_{+\nu\lambda}u_\rho\rangle$		228
$i\langle V^\mu\chi_+\nabla_\mu\chi_+\rangle+\text{H.c.}$	69	113	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu f_{-\lambda\rho}\chi_-\rangle+\text{H.c.}$	120	229
$\langle V^\mu u_\mu u^\nu u_\nu\chi_-\rangle+\text{H.c.}$	70	114	$\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu u_\nu u_\lambda\nabla_\rho\chi_-\rangle+\text{H.c.}$	121	230
$\langle V^\mu u^\nu u_\mu u_\nu\chi_-\rangle+\text{H.c.}$	71	115	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu f_{+\nu\lambda}\nabla_\rho\chi_-\rangle+\text{H.c.}$	122	231
$\langle V^\mu u^\nu u_\nu u_\mu\chi_-\rangle+\text{H.c.}$		116	$i\varepsilon^{\mu\nu\lambda\rho}\langle V_\mu\rangle\langle f_{+\nu\lambda}\nabla_\rho\chi_-\rangle$	123	

X. THE NNLO CHIRAL LAGRANGIANS IN TENSOR-FIELD REPRESENTATION

Table A2. The NNLO chiral Lagrangians with vector meson in the tensor-field representation

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle W^{\mu\nu}u_\mu u_\nu u^\lambda u_\lambda u^\rho u_\rho\rangle+\text{H.c.}$	1	1	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u_\nu\rangle\langle u^\delta u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$		1104
$i\langle W^{\mu\nu}u_\mu u_\nu u^\lambda u^\rho u_\lambda u_\rho\rangle+\text{H.c.}$	2	2	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta\rangle\langle u_\nu u_\sigma u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$		1105
$i\langle W^{\mu\nu}u_\mu u_\nu u^\lambda u^\rho u_\rho u_\lambda\rangle+\text{H.c.}$		3	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\nu\rangle\langle u_\sigma u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$		1106
$i\langle W^{\mu\nu}u_\mu u^\lambda u_\nu u_\lambda u^\rho u_\rho\rangle+\text{H.c.}$	3	4	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu\rangle\langle u_\sigma u_\lambda u^\delta f_{-\rho\delta}\rangle+\text{H.c.}$		1107
$i\langle W^{\mu\nu}u_\mu u^\lambda u_\nu u^\rho u_\lambda u_\rho\rangle+\text{H.c.}$	4	5	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu\rangle\langle u_\sigma u^\delta u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$		1108
$i\langle W^{\mu\nu}u_\mu u^\lambda u_\nu u^\rho u_\rho u_\lambda\rangle+\text{H.c.}$		6	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma f_{-\mu\nu}\rangle\langle W_\lambda{}^\delta u_\rho u_\delta u_\sigma\rangle+\text{H.c.}$	504	1109
$i\langle W^{\mu\nu}u_\mu u^\lambda u_\lambda u_\nu u^\rho u_\rho\rangle+\text{H.c.}$		7	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu\rangle\langle u_\lambda u^\delta u_\delta f_{-\rho\sigma}\rangle+\text{H.c.}$	505	
$i\langle W^{\mu\nu}u_\mu u^\lambda u_\lambda u^\rho u_\nu u_\rho\rangle+\text{H.c.}$		8	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma f_{-\mu}{}^\delta\rangle\langle W_{\nu\delta}u_\lambda u_\rho u_\sigma\rangle+\text{H.c.}$	506	
$i\langle W^{\mu\nu}u_\mu u^\lambda u_\lambda u^\rho u_\rho u_\nu\rangle$		9	$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}\rangle\langle u_\sigma u_\delta u_\mu u_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$	507	
$i\langle W^{\mu\nu}u_\mu u^\lambda u^\rho u_\lambda u_\nu u_\rho\rangle+\text{H.c.}$		10	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu\rangle\langle u_\lambda u_\rho u^\delta f_{-\sigma\delta}\rangle+\text{H.c.}$		1110
$i\langle W^{\mu\nu}u_\mu u^\lambda u^\rho u_\nu u_\lambda u_\rho\rangle+\text{H.c.}$		11	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma f_{-\sigma}{}^\delta\rangle\langle W_{\mu\delta}u_\nu u_\lambda u_\rho\rangle$		1111
$i\langle W^{\mu\nu}u_\mu u^\lambda u^\rho u_\nu u_\rho u_\lambda\rangle+\text{H.c.}$		12	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu f_-{}^{\sigma\delta}\rangle\langle W_{\nu\sigma}u_\lambda u_\rho u_\delta\rangle+\text{H.c.}$		1112
$i\langle W^{\mu\nu}u_\mu u^\lambda u^\rho u_\lambda u_\rho u_\nu\rangle$		13	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta\rangle\langle u_\sigma u_\lambda f_{-\rho\delta}\rangle+\text{H.c.}$		1113
$i\langle W^{\mu\nu}u_\mu u^\lambda u^\rho u_\rho u_\nu u_\lambda\rangle+\text{H.c.}$		14	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta\rangle\langle u_\sigma u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$		1114
$i\langle W^{\mu\nu}u_\mu u^\lambda u^\rho u_\rho u_\lambda u_\nu\rangle$		15	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta\rangle\langle u_\lambda u_\sigma f_{-\rho\delta}\rangle+\text{H.c.}$		1115
$i\langle W^{\mu\nu}u^\lambda u_\mu u_\nu u_\lambda u^\rho u_\rho\rangle+\text{H.c.}$		16	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta\rangle\langle u_\lambda u_\rho f_{-\sigma\delta}\rangle+\text{H.c.}$		1116
$i\langle W^{\mu\nu}u^\lambda u_\mu u_\nu u^\rho u_\lambda u_\rho\rangle+\text{H.c.}$		17	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta\rangle\langle u_\sigma u_\nu u_\lambda f_{-\rho\delta}\rangle+\text{H.c.}$		1117
$i\langle W^{\mu\nu}u^\lambda u_\mu u_\nu u^\rho u_\rho u_\lambda\rangle+\text{H.c.}$		18	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta\rangle\langle u_\sigma u_\nu u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$		1118
$i\langle W^{\mu\nu}u^\lambda u_\mu u_\lambda u_\nu u^\rho u_\rho\rangle+\text{H.c.}$		19	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\delta\rangle\langle u_\sigma u_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$		1119
$i\langle W^{\mu\nu}u^\lambda u_\mu u_\lambda u^\rho u_\nu u_\rho\rangle$		20	$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_\mu\rangle\langle u_\sigma u_\delta u_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$		1120
$i\langle W^{\mu\nu}u^\lambda u_\mu u^\rho u_\lambda u_\nu u_\rho\rangle$		21	$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_\mu\rangle\langle u_\sigma u_\nu u_\lambda f_{-\rho\delta}\rangle+\text{H.c.}$		1121
$i\langle W^{\mu\nu}u^\lambda u_\mu u^\rho u_\nu u_\lambda u_\rho\rangle+\text{H.c.}$		22	$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_\mu\rangle\langle u_\nu u_\lambda u_\rho f_{-\sigma\delta}\rangle$		1122
$i\langle W^{\mu\nu}u^\lambda u_\mu u^\rho u_\nu u_\rho u_\lambda\rangle+\text{H.c.}$		23	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u_\sigma\rangle\langle W_{\mu\nu}u_\lambda u^\delta f_{-\rho\delta}\rangle+\text{H.c.}$	508	1123
$i\langle W^{\mu\nu}u^\lambda u_\mu u^\rho u_\rho u_\nu u_\lambda\rangle$		24	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u^\delta\rangle\langle W_{\mu\nu}u_\lambda u_\sigma f_{-\rho\delta}\rangle+\text{H.c.}$		1124
$i\langle W^{\mu\nu}u^\lambda u_\lambda u_\mu u_\nu u^\rho u_\rho\rangle$		25	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u_\sigma\rangle\langle W_\mu{}^\delta u_\delta u_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$	509	1125
$i\langle W^{\mu\nu}u^\lambda u^\rho u_\mu u_\nu u_\rho u_\lambda\rangle$		26	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda}u_\rho u^\delta f_{-\sigma\delta}\rangle+\text{H.c.}$		1126
$i\langle W^{\mu\nu}u^\lambda u^\rho u_\mu u_\nu u_\lambda u_\rho\rangle$		27	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u_\sigma\rangle\langle W_{\mu\nu}u^\delta u_\lambda f_{-\rho\delta}\rangle+\text{H.c.}$	510	1127

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle W^{\mu\nu}\rangle\langle u_\mu u_\nu u^\lambda u_\lambda u^\rho u_\rho\rangle$		28	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u^\delta\rangle\langle W_{\mu\nu}u_\sigma u_\lambda f_{-\rho\delta}\rangle+\text{H.c.}$		1128
$i\langle W^{\mu\nu}u_\mu u_\nu\rangle\langle u^\lambda u_\lambda u^\rho u_\rho\rangle$		29	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda}u^\delta u_\rho f_{-\sigma\delta}\rangle+\text{H.c.}$		1129
$i\langle W^{\mu\nu}\rangle\langle u_\mu u_\nu u^\lambda u^\rho u_\lambda u_\rho\rangle$		30	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u_\sigma\rangle\langle W_{\mu\nu}u^\delta u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$		1130
$i\langle W^{\mu\nu}\rangle\langle u_\mu u^\lambda u_\nu u_\lambda u^\rho u_\rho\rangle+\text{H.c.}$		31	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda}u^\delta u_\delta f_{-\rho\sigma}\rangle+\text{H.c.}$		1131
$i\langle W^{\mu\nu}u_\mu u_\nu f_-{}^{\lambda\rho}f_{-\lambda\rho}\rangle+\text{H.c.}$	5	32	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u^\delta\rangle\langle W_{\mu\nu}u_\sigma u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$		1132
$i\langle W^{\mu\nu}u_\mu u^\lambda f_{-\nu}{}^\rho f_{-\lambda\rho}\rangle+\text{H.c.}$	6	33	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda}u^\delta u_\sigma f_{-\rho\delta}\rangle+\text{H.c.}$	511	1133
$i\langle W^{\mu\nu}u_\mu u^\lambda f_{-\lambda}{}^\rho f_{-\nu\rho}\rangle+\text{H.c.}$	7	34	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda}u_\sigma u^\delta f_{-\rho\delta}\rangle+\text{H.c.}$	512	1134
$i\langle W^{\mu\nu}u^\lambda u_\mu f_{-\nu}{}^\rho f_{-\lambda\rho}\rangle+\text{H.c.}$	8	35	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\nu{}^\delta u_\sigma u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$	513	1135
$i\langle W^{\mu\nu}u^\lambda u_\mu f_{-\lambda}{}^\rho f_{-\nu\rho}\rangle+\text{H.c.}$		36	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\nu{}^\delta u_\delta u_\sigma f_{-\lambda\rho}\rangle+\text{H.c.}$	514	1136
$i\langle W^{\mu\nu}u^\lambda u_\lambda f_{-\mu}{}^\rho f_{-\nu\rho}\rangle+\text{H.c.}$	9	37	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u_\sigma\rangle\langle W_\mu{}^\delta u_\nu u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$	515	1137
$i\langle W^{\mu\nu}u^\lambda u^\rho f_{-\mu\nu}f_{-\lambda\rho}\rangle+\text{H.c.}$	10	38	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u_\sigma\rangle\langle W_\mu{}^\delta u_\nu u_\lambda f_{-\rho\delta}\rangle+\text{H.c.}$	516	
$i\langle W^{\mu\nu}u^\lambda u^\rho f_{-\mu\lambda}f_{-\nu\rho}\rangle+\text{H.c.}$	11	39	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\nu{}^\delta u_\lambda u_\delta f_{-\rho\sigma}\rangle+\text{H.c.}$		1138
$i\langle W^{\mu\nu}u^\lambda u^\rho f_{-\mu\rho}f_{-\nu\lambda}\rangle+\text{H.c.}$	12	40	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\nu{}^\delta u_\lambda u_\rho f_{-\sigma\delta}\rangle+\text{H.c.}$		1139
$i\langle W^{\mu\nu}u^\lambda u^\rho f_{-\lambda\rho}f_{-\mu\nu}\rangle+\text{H.c.}$	13	41	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\nu{}^\delta u_\lambda u_\sigma f_{-\rho\delta}\rangle+\text{H.c.}$	517	1140
$i\langle W^{\mu\nu}u_\mu f_{-\nu}{}^\lambda u^\rho f_{-\lambda\rho}\rangle+\text{H.c.}$	14	42	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\nu{}^\delta u_\sigma u_\lambda f_{-\rho\delta}\rangle+\text{H.c.}$	518	
$i\langle W^{\mu\nu}u_\mu f_-{}^{\lambda\rho}u_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$	15	43	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u^\delta\rangle\langle W_{\mu\sigma}u_\nu u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$		1141
$i\langle W^{\mu\nu}u_\mu f_-{}^{\lambda\rho}u_\lambda f_{-\nu\rho}\rangle+\text{H.c.}$	16	44	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\sigma}u^\delta u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$		1142
$i\langle W^{\mu\nu}u^\lambda f_{-\mu\nu}u^\rho f_{-\lambda\rho}\rangle+\text{H.c.}$	17	45	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u^\delta\rangle\langle W_{\mu\sigma}u_\delta u_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$		1143
$i\langle W^{\mu\nu}u^\lambda f_{-\mu\lambda}u^\rho f_{-\nu\rho}\rangle+\text{H.c.}$	18	46	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\sigma{}^\delta u_\delta u_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$		1144
$i\langle W^{\mu\nu}u^\lambda f_{-\mu}{}^\rho u_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$	19	47	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\sigma{}^\delta u_\nu u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$		1145
$i\langle W^{\mu\nu}u^\lambda f_{-\mu}{}^\rho u_\lambda f_{-\nu\rho}\rangle+\text{H.c.}$	20	48	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda f_{-\rho}{}^\sigma\rangle\langle u_\sigma u^\delta u_\delta\rangle+\text{H.c.}$		1146
$i\langle W^{\mu\nu}u^\lambda f_{-\mu}{}^\rho u_\rho f_{-\nu\lambda}\rangle+\text{H.c.}$	21	49	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u_\sigma\rangle\langle W_{\mu\nu}u_\lambda f_{-\rho}{}^\delta u_\delta\rangle+\text{H.c.}$	519	1147
$i\langle W^{\mu\nu}u^\lambda f_{-\lambda}{}^\rho u_\mu f_{-\nu\rho}\rangle+\text{H.c.}$		50	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u^\delta\rangle\langle W_{\mu\nu}u_\lambda f_{-\rho\sigma}u_\delta\rangle+\text{H.c.}$		1148
$i\langle W^{\mu\nu}u^\lambda f_{-\lambda}{}^\rho u_\rho f_{-\mu\nu}\rangle+\text{H.c.}$		51	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda f_-{}^{\sigma\delta}\rangle\langle u_\rho u_\sigma u_\delta\rangle+\text{H.c.}$		1149
$i\langle W^{\mu\nu}u_\mu f_{-\nu}{}^\lambda f_{-\lambda}{}^\rho u_\rho\rangle+\text{H.c.}$		52	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda}u_\rho f_{-\sigma}{}^\delta u_\delta\rangle+\text{H.c.}$	520	1150
$i\langle W^{\mu\nu}u_\mu f_-{}^{\lambda\rho}f_{\nu\lambda}u_\rho\rangle+\text{H.c.}$		53	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{-\lambda\rho}\rangle\langle u_\sigma u^\delta u_\delta\rangle+\text{H.c.}$		1151
$i\langle W^{\mu\nu}u_\mu f_-{}^{\lambda\rho}f_{-\lambda\rho}u_\nu\rangle$		54	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{-\lambda\sigma}\rangle\langle u_\rho u^\delta u_\delta\rangle+\text{H.c.}$		1152
$i\langle W^{\mu\nu}u^\lambda f_{-\mu\nu}f_{-\lambda}{}^\rho u_\rho\rangle+\text{H.c.}$		55	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda}u^\delta f_{-\rho\delta}u_\sigma\rangle+\text{H.c.}$	521	1153
$i\langle W^{\mu\nu}u^\lambda f_{-\mu\lambda}f_{-\nu}{}^\rho u_\rho\rangle$		56	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{-\lambda}{}^\delta\rangle\langle u_\rho u_\delta u_\sigma\rangle+\text{H.c.}$		1154
$i\langle W^{\mu\nu}u^\lambda f_{-\mu}{}^\rho f_{-\nu\lambda}u_\rho\rangle$		57	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{-\sigma}{}^\delta\rangle\langle u_\lambda u_\rho u_\delta\rangle+\text{H.c.}$		1155
$i\langle W^{\mu\nu}u^\lambda f_{-\mu}{}^\rho f_{-\nu\rho}u_\lambda\rangle$		58	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\sigma}u_\lambda f_-{}^\delta u_\delta\rangle+\text{H.c.}$		1156
$i\langle W^{\mu\nu}f_{-\mu\nu}u^\lambda u^\rho f_{-\lambda\rho}\rangle+\text{H.c.}$		59	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma f_{-\nu\lambda}\rangle\langle u_\rho u^\delta u_\delta\rangle+\text{H.c.}$		1157
$i\langle W^{\mu\nu}f_-{}^\lambda u_\nu u^\rho f_{-\lambda\rho}\rangle+\text{H.c.}$		60	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u_\sigma\rangle\langle W_\mu{}^\delta u_\delta f_{-\nu\lambda}u_\rho\rangle+\text{H.c.}$	522	1158
$i\langle W^{\mu\nu}f_-{}^\lambda u_\lambda u^\rho f_{-\nu\rho}\rangle$		61	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\nu{}^\delta u_\delta f_{-\lambda\rho}u_\sigma\rangle+\text{H.c.}$	523	1159
$i\langle W^{\mu\nu}f_-{}^\lambda u^\rho u_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$		62	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\nu{}^\delta u_\lambda f_{-\rho\delta}u_\sigma\rangle+\text{H.c.}$	524	
$i\langle W^{\mu\nu}f_-{}^\lambda u^\rho u_\lambda f_{-\nu\rho}\rangle$		63	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu f_{-\sigma}{}^\delta\rangle\langle u_\lambda u_\rho u_\delta\rangle+\text{H.c.}$		1160
$i\langle W^{\mu\nu}f_-{}^\lambda u^\rho u_\rho f_{-\nu\lambda}\rangle$		64	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta f_{-\sigma\delta}\rangle\langle u_\nu u_\lambda u_\rho\rangle+\text{H.c.}$		1161

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle W^{\mu\nu} f_-^{\lambda\rho} u_\mu u_\nu f_{-\lambda\rho}\rangle$		65	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta f_{-\nu\lambda}\rangle\langle u_\rho u_\delta u_\sigma\rangle + \text{H.c.}$		1162
$i\langle W^{\mu\nu} u_\mu u^\lambda f_{-\nu}{}^\rho h_{\lambda\rho}\rangle + \text{H.c.}$	22	66	$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta} u_\sigma f_{-\mu\delta}\rangle\langle u_\nu u_\lambda u_\rho\rangle + \text{H.c.}$		1163
$i\langle W^{\mu\nu} u_\mu u^\lambda f_{-\lambda}{}^\rho h_{\nu\rho}\rangle + \text{H.c.}$	23	67	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\sigma{}^\delta u_\delta f_{-\nu\lambda} u_\rho\rangle + \text{H.c.}$		1164
$i\langle W^{\mu\nu} u^\lambda u_\mu f_{-\nu}{}^\rho h_{\lambda\rho}\rangle + \text{H.c.}$	24	68	$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta} u_\mu f_{-\sigma\delta}\rangle\langle u_\nu u_\lambda u_\rho\rangle + \text{H.c.}$		1165
$i\langle W^{\mu\nu} u^\lambda u_\mu f_{-\lambda}{}^\rho h_{\nu\rho}\rangle + \text{H.c.}$	25	69	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} f_-^{\sigma\delta}\rangle\langle u_\lambda u_\sigma u_\rho u_\delta\rangle$		1166
$i\langle W^{\mu\nu} u^\lambda u_\lambda f_{-\mu}{}^\rho h_{\nu\rho}\rangle + \text{H.c.}$	26	70	$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta} f_{-\mu\nu}\rangle\langle u_\lambda u_\sigma u_\rho u_\delta\rangle$		1167
$i\langle W^{\mu\nu} u^\lambda u^\rho f_{-\mu\nu} h_{\lambda\rho}\rangle + \text{H.c.}$	27	71	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u_\rho u^\sigma u^\delta h_{\sigma\delta}\rangle + \text{H.c.}$		1168
$i\langle W^{\mu\nu} u^\lambda u^\rho f_{-\mu\lambda} h_{\nu\rho}\rangle + \text{H.c.}$	28	72	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda\rangle\langle u_\rho u^\sigma u^\delta h_{\sigma\delta}\rangle + \text{H.c.}$		1169
$i\langle W^{\mu\nu} u^\lambda u^\rho f_{-\mu\rho} h_{\nu\lambda}\rangle + \text{H.c.}$	29	73	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u_\rho\rangle\langle u^\sigma u^\delta h_{\sigma\delta}\rangle$		1170
$i\langle W^{\mu\nu} u_\mu u^\lambda h_\nu{}^\rho f_{-\lambda\rho}\rangle + \text{H.c.}$	30	74	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma h_\sigma{}^\delta\rangle\langle W_{\mu\nu} u_\lambda u_\rho u_\delta\rangle + \text{H.c.}$	525	1171
$i\langle W^{\mu\nu} u_\mu u^\lambda h_\lambda{}^\rho f_{-\nu\rho}\rangle + \text{H.c.}$	31	75	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u^\sigma u_\rho u^\delta h_{\sigma\delta}\rangle + \text{H.c.}$		1172
$i\langle W^{\mu\nu} u^\lambda u_\mu h_\nu{}^\rho f_{-\lambda\rho}\rangle + \text{H.c.}$		76	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma\rangle\langle u_\rho u^\delta h_{\sigma\delta}\rangle + \text{H.c.}$		1173
$i\langle W^{\mu\nu} u^\lambda u_\mu h_\lambda{}^\rho f_{-\nu\rho}\rangle + \text{H.c.}$		77	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma h_\sigma{}^\delta\rangle\langle W_{\mu\nu} u_\lambda u_\delta u_\rho\rangle$		1174
$i\langle W^{\mu\nu} u^\lambda u_\lambda h_\mu{}^\rho f_{-\nu\rho}\rangle + \text{H.c.}$		78	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u^\sigma u_\sigma u^\delta h_{\rho\delta}\rangle + \text{H.c.}$		1175
$i\langle W^{\mu\nu} u^\lambda u^\rho h_{\mu\lambda} f_{-\nu\rho}\rangle + \text{H.c.}$	32	79	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda\rangle\langle u^\sigma u_\sigma u^\delta h_{\rho\delta}\rangle + \text{H.c.}$		1176
$i\langle W^{\mu\nu} u^\lambda u^\rho h_{\mu\rho} f_{-\nu\lambda}\rangle + \text{H.c.}$		80	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma\rangle\langle u_\sigma u^\delta h_{\rho\delta}\rangle + \text{H.c.}$		1177
$i\langle W^{\mu\nu} u^\lambda u^\rho h_{\lambda\rho} f_{-\mu\nu}\rangle + \text{H.c.}$		81	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma h_{\mu\sigma}\rangle\langle W_{\nu\lambda} u_\rho u^\delta u_\delta\rangle + \text{H.c.}$		1178
$i\langle W^{\mu\nu} u_\mu f_{-\nu}{}^\lambda u^\rho h_{\lambda\rho}\rangle + \text{H.c.}$	33	82	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u^\sigma u^\delta u_\rho h_{\sigma\delta}\rangle$		1179
$i\langle W^{\mu\nu} u_\mu f_-^{\lambda\rho} u_\lambda h_{\nu\rho}\rangle + \text{H.c.}$	34	83	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma\rangle\langle u^\delta u_\rho h_{\sigma\delta}\rangle + \text{H.c.}$		1180
$i\langle W^{\mu\nu} u^\lambda f_{-\mu\nu} u^\rho h_{\lambda\rho}\rangle + \text{H.c.}$	35	84	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu h^{\sigma\delta}\rangle\langle W_{\nu\lambda} u_\rho u_\sigma u_\delta\rangle + \text{H.c.}$		1181
$i\langle W^{\mu\nu} u^\lambda f_{-\mu\lambda} u^\rho h_{\nu\rho}\rangle + \text{H.c.}$	36	85	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u^\sigma u^\delta u_\sigma h_{\rho\delta}\rangle + \text{H.c.}$		1182
$i\langle W^{\mu\nu} u^\lambda f_{-\mu}{}^\rho u_\nu h_{\lambda\rho}\rangle + \text{H.c.}$	37	86	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma\rangle\langle u^\delta u_\sigma h_{\rho\delta}\rangle + \text{H.c.}$		1183
$i\langle W^{\mu\nu} u^\lambda f_{-\mu}{}^\rho u_\lambda h_{\nu\rho}\rangle + \text{H.c.}$	38	87	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma h_\mu{}^\delta\rangle\langle W_{\nu\lambda} u_\rho u_\sigma u_\delta\rangle + \text{H.c.}$		1184
$i\langle W^{\mu\nu} u^\lambda f_{-\mu}{}^\rho u_\rho h_{\nu\lambda}\rangle + \text{H.c.}$	39	88	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u^\sigma u^\delta u_\delta h_{\rho\sigma}\rangle + \text{H.c.}$		1185
$i\langle W^{\mu\nu} u^\lambda f_{-\lambda}{}^\rho u_\mu h_{\nu\rho}\rangle + \text{H.c.}$	40	89	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma\rangle\langle u^\delta u_\delta h_{\rho\sigma}\rangle + \text{H.c.}$		1186
$i\langle W^{\mu\nu} u_\mu f_{-\nu}{}^\lambda h_\lambda{}^\rho u_\rho\rangle + \text{H.c.}$	41	90	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma h_\mu{}^\delta\rangle\langle W_{\nu\lambda} u_\rho u_\delta u_\sigma\rangle + \text{H.c.}$		1187
$i\langle W^{\mu\nu} u_\mu f_-^{\lambda\rho} h_{\nu\lambda} u_\rho\rangle + \text{H.c.}$	42	91	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u^\sigma u_\lambda u_\rho u^\delta h_{\sigma\delta}\rangle$		1188
$i\langle W^{\mu\nu} u^\lambda f_{-\mu\nu} h_\lambda{}^\rho u_\rho\rangle + \text{H.c.}$	43	92	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma\rangle\langle u_\lambda u_\rho u^\delta h_{\sigma\delta}\rangle + \text{H.c.}$	526	1189
$i\langle W^{\mu\nu} u^\lambda f_{-\mu\lambda} h_\nu{}^\rho u_\rho\rangle + \text{H.c.}$	44	93	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u^\sigma u_\lambda u_\sigma u^\delta h_{\rho\delta}\rangle + \text{H.c.}$		1190
$i\langle W^{\mu\nu} u^\lambda f_{-\mu}{}^\rho h_{\nu\lambda} u_\rho\rangle + \text{H.c.}$		94	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma\rangle\langle u_\lambda u_\sigma u^\delta h_{\rho\delta}\rangle + \text{H.c.}$		1191
$i\langle W^{\mu\nu} u^\lambda f_{-\mu}{}^\rho h_{\nu\rho} u_\lambda\rangle + \text{H.c.}$	45	95	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma\rangle\langle u_\lambda u^\delta u_\rho h_{\sigma\delta}\rangle$		1192
$i\langle W^{\mu\nu} u^\lambda f_{-\mu}{}^\rho h_{\lambda\rho} u_\nu\rangle + \text{H.c.}$		96	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u^\sigma u_\lambda u^\delta u_\sigma h_{\rho\delta}\rangle + \text{H.c.}$		1193
$i\langle W^{\mu\nu} u^\lambda f_{-\lambda}{}^\rho h_{\mu\rho} u_\nu\rangle + \text{H.c.}$		97	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma\rangle\langle u_\lambda u^\delta u_\sigma h_{\rho\delta}\rangle + \text{H.c.}$		1194
$i\langle W^{\mu\nu} u_\mu h_\nu{}^\lambda u^\rho f_{-\lambda\rho}\rangle + \text{H.c.}$		98	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma h_\mu{}^\delta\rangle\langle W_{\nu\lambda} u_\sigma u_\rho u_\delta\rangle + \text{H.c.}$		1195
$i\langle W^{\mu\nu} u_\mu h^{\lambda\rho} u_\lambda f_{-\nu\rho}\rangle + \text{H.c.}$		99	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u^\sigma u_\lambda u^\delta u_\delta h_{\rho\sigma}\rangle + \text{H.c.}$		1196
$i\langle W^{\mu\nu} u^\lambda h_{\mu\lambda} u^\rho f_{-\nu\rho}\rangle + \text{H.c.}$		100	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma\rangle\langle u_\lambda u^\delta u_\delta h_{\rho\sigma}\rangle + \text{H.c.}$		1197
$i\langle W^{\mu\nu} u^\lambda h_\mu{}^\rho u_\nu f_{-\lambda\rho}\rangle + \text{H.c.}$		101	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma\rangle\langle u_\sigma u_\lambda u^\delta h_{\rho\delta}\rangle + \text{H.c.}$		1198

Continued on next page

Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle W^{\mu\nu}u^{\lambda}h_{\mu}{}^{\rho}u_{\lambda}f_{-\nu\rho}\rangle+\text{H.c.}$		102	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^{\sigma}u_{\sigma}\rangle\langle u_{\lambda}u^{\delta}h_{\rho\delta}\rangle+\text{H.c.}$		1199
$i\langle W^{\mu\nu}u^{\lambda}h_{\mu}{}^{\rho}u_{\rho}f_{-\nu\lambda}\rangle+\text{H.c.}$		103	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\nu}u_{\lambda}\rangle\langle u^{\delta}u_{\sigma}h_{\rho\delta}\rangle+\text{H.c.}$		1200
$i\langle W^{\mu\nu}u^{\lambda}h_{\lambda}{}^{\rho}u_{\mu}f_{-\nu\rho}\rangle+\text{H.c.}$		104	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_{\mu}h_{\nu}{}^{\sigma}\rangle\langle W_{\lambda\rho}u^{\delta}u_{\delta}u_{\sigma}\rangle+\text{H.c.}$		1201
$i\langle W^{\mu\nu}u^{\lambda}h_{\lambda}{}^{\rho}u_{\rho}f_{-\mu\nu}\rangle+\text{H.c.}$		105	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^{\sigma}u^{\delta}\rangle\langle u_{\lambda}u_{\delta}h_{\rho\sigma}\rangle+\text{H.c.}$		1202
$i\langle W^{\mu\nu}f_{-\mu\nu}u^{\lambda}u^{\rho}h_{\lambda\rho}\rangle+\text{H.c.}$		106	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^{\sigma}h_{\mu}{}^{\delta}\rangle\langle W_{\nu\sigma}u_{\lambda}u_{\rho}u_{\delta}\rangle+\text{H.c.}$		1203
$i\langle W^{\mu\nu}f_{-\mu}{}^{\lambda}u_{\nu}u^{\rho}h_{\lambda\rho}\rangle+\text{H.c.}$		107	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^{\sigma}u^{\delta}\rangle\langle u_{\lambda}u_{\rho}h_{\sigma\delta}\rangle$		1204
$i\langle W^{\mu\nu}f_{-\mu}{}^{\lambda}u_{\lambda}u^{\rho}h_{\nu\rho}\rangle+\text{H.c.}$		108	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^{\sigma}u^{\delta}\rangle\langle u_{\lambda}u_{\sigma}h_{\rho\delta}\rangle+\text{H.c.}$		1205
$i\langle W^{\mu\nu}f_{-\mu}{}^{\lambda}u^{\rho}u_{\nu}h_{\lambda\rho}\rangle+\text{H.c.}$		109	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_{\mu}h_{\nu}{}^{\sigma}\rangle\langle W_{\lambda\sigma}u_{\rho}u^{\delta}u_{\delta}\rangle+\text{H.c.}$		1206
$i\langle W^{\mu\nu}f_{-\mu}{}^{\lambda}u^{\rho}u_{\lambda}h_{\nu\rho}\rangle+\text{H.c.}$		110	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\sigma}\rangle\langle u_{\nu}u_{\lambda}u^{\delta}h_{\rho\delta}\rangle+\text{H.c.}$		1207
$i\langle W^{\mu\nu}f_{-\mu}{}^{\lambda}u^{\rho}u_{\rho}h_{\nu\lambda}\rangle+\text{H.c.}$		111	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\sigma}u_{\nu}\rangle\langle u_{\lambda}u^{\delta}h_{\rho\delta}\rangle+\text{H.c.}$		1208
$i\langle W^{\mu\nu}f_{-}{}^{\lambda\rho}u_{\mu}u_{\lambda}h_{\nu\rho}\rangle+\text{H.c.}$		112	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^{\sigma}h_{\mu\sigma}\rangle\langle W_{\nu}{}^{\delta}u_{\delta}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$		1209
$i\langle W^{\mu\nu}f_{-}{}^{\lambda\rho}u_{\lambda}u_{\mu}h_{\nu\rho}\rangle+\text{H.c.}$		113	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\sigma}\rangle\langle u_{\nu}u^{\delta}u_{\lambda}h_{\rho\delta}\rangle$		1210
$i\langle W^{\mu\nu}u_{\mu}u_{\nu}h^{\lambda\rho}h_{\lambda\rho}\rangle+\text{H.c.}$	46	114	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\sigma}u_{\nu}\rangle\langle u^{\delta}u_{\lambda}h_{\rho\delta}\rangle+\text{H.c.}$		1211
$i\langle W^{\mu\nu}u_{\mu}u^{\lambda}h_{\nu}{}^{\rho}h_{\lambda\rho}\rangle+\text{H.c.}$	47	115	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_{\mu}h_{\nu}{}^{\sigma}\rangle\langle W_{\lambda}{}^{\delta}u_{\delta}u_{\rho}u_{\sigma}\rangle+\text{H.c.}$		1212
$i\langle W^{\mu\nu}u_{\mu}u^{\lambda}h_{\lambda}{}^{\rho}h_{\nu\rho}\rangle+\text{H.c.}$	48	116	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\sigma}u^{\delta}\rangle\langle u_{\nu}u_{\lambda}h_{\rho\delta}\rangle+\text{H.c.}$		1213
$i\langle W^{\mu\nu}u^{\lambda}u_{\mu}h_{\nu}{}^{\rho}h_{\lambda\rho}\rangle+\text{H.c.}$	49	117	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_{\mu}h_{\nu}{}^{\sigma}\rangle\langle W_{\lambda}{}^{\delta}u_{\delta}u_{\sigma}u_{\rho}\rangle+\text{H.c.}$		1214
$i\langle W^{\mu\nu}u^{\lambda}u_{\mu}h_{\lambda}{}^{\rho}h_{\nu\rho}\rangle+\text{H.c.}$		118	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\nu}\rangle\langle u_{\sigma}u_{\lambda}u^{\delta}h_{\rho\delta}\rangle+\text{H.c.}$		1215
$i\langle W^{\mu\nu}u^{\lambda}u_{\lambda}h_{\mu}{}^{\rho}h_{\nu\rho}\rangle+\text{H.c.}$	50	119	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\nu}\rangle\langle u_{\sigma}u^{\delta}u_{\lambda}h_{\rho\delta}\rangle+\text{H.c.}$		1216
$i\langle W^{\mu\nu}u^{\lambda}u^{\rho}h_{\mu\lambda}h_{\nu\rho}\rangle+\text{H.c.}$	51	120	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\nu}u^{\delta}\rangle\langle u_{\lambda}u_{\delta}h_{\rho\sigma}\rangle+\text{H.c.}$		1217
$i\langle W^{\mu\nu}u^{\lambda}u^{\rho}h_{\mu\rho}h_{\nu\lambda}\rangle+\text{H.c.}$	52	121	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\nu}\rangle\langle u_{\lambda}u_{\sigma}u^{\delta}h_{\rho\delta}\rangle+\text{H.c.}$		1218
$i\langle W^{\mu\nu}u_{\mu}h_{\nu}{}^{\lambda}u^{\rho}h_{\lambda\rho}\rangle+\text{H.c.}$	53	122	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\nu}\rangle\langle u_{\lambda}u_{\rho}u^{\delta}h_{\sigma\delta}\rangle+\text{H.c.}$		1219
$i\langle W^{\mu\nu}u_{\mu}h^{\lambda\rho}u_{\nu}h_{\lambda\rho}\rangle+\text{H.c.}$	54	123	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\nu}u_{\lambda}\rangle\langle u_{\rho}u^{\delta}h_{\sigma\delta}\rangle+\text{H.c.}$		1220
$i\langle W^{\mu\nu}u_{\mu}h^{\lambda\rho}u_{\lambda}h_{\nu\rho}\rangle+\text{H.c.}$	55	124	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^{\sigma}h_{\sigma}{}^{\delta}\rangle\langle W_{\mu\delta}u_{\nu}u_{\lambda}u_{\rho}\rangle$		1221
$i\langle W^{\mu\nu}u^{\lambda}h_{\mu\lambda}u^{\rho}h_{\nu\rho}\rangle+\text{H.c.}$	56	125	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_{\mu}h^{\sigma\delta}\rangle\langle W_{\nu\sigma}u_{\lambda}u_{\rho}u_{\delta}\rangle+\text{H.c.}$		1222
$i\langle W^{\mu\nu}u^{\lambda}h_{\mu}{}^{\rho}u_{\nu}h_{\lambda\rho}\rangle+\text{H.c.}$	57	126	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\nu}\rangle\langle u_{\lambda}u^{\delta}u_{\delta}h_{\rho\sigma}\rangle+\text{H.c.}$		1223
$i\langle W^{\mu\nu}u^{\lambda}h_{\mu}{}^{\rho}u_{\lambda}h_{\nu\rho}\rangle+\text{H.c.}$	58	127	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^{\sigma}h_{\mu}{}^{\delta}\rangle\langle W_{\nu\delta}u_{\lambda}u_{\rho}u_{\sigma}\rangle+\text{H.c.}$		1224
$i\langle W^{\mu\nu}u^{\lambda}h_{\mu}{}^{\rho}u_{\rho}h_{\nu\lambda}\rangle+\text{H.c.}$		128	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\nu}u^{\delta}\rangle\langle u_{\sigma}u_{\lambda}h_{\rho\delta}\rangle+\text{H.c.}$		1225
$i\langle W^{\mu\nu}u^{\lambda}h_{\lambda}{}^{\rho}u_{\mu}h_{\nu\rho}\rangle+\text{H.c.}$		129	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\nu}u^{\delta}\rangle\langle u_{\lambda}u_{\sigma}h_{\rho\delta}\rangle+\text{H.c.}$		1226
$i\langle W^{\mu\nu}u_{\mu}h_{\nu}{}^{\lambda}h_{\lambda}{}^{\rho}u_{\rho}\rangle+\text{H.c.}$		130	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\nu}u^{\delta}\rangle\langle u_{\lambda}u_{\rho}h_{\sigma\delta}\rangle+\text{H.c.}$		1227
$i\langle W^{\mu\nu}u_{\mu}h^{\lambda\rho}h_{\nu\lambda}u_{\rho}\rangle+\text{H.c.}$		131	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_{\mu}h^{\sigma\delta}\rangle\langle W_{\nu\sigma}u_{\lambda}u_{\delta}u_{\rho}\rangle$		1228
$i\langle W^{\mu\nu}u_{\mu}h^{\lambda\rho}h_{\lambda\rho}u_{\nu}\rangle$		132	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\nu}u^{\delta}\rangle\langle u_{\delta}u_{\lambda}h_{\rho\sigma}\rangle+\text{H.c.}$		1229
$i\langle W^{\mu\nu}u^{\lambda}h_{\mu\lambda}h_{\nu}{}^{\rho}u_{\rho}\rangle$		133	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u^{\delta}\rangle\langle u_{\sigma}u_{\nu}u_{\lambda}h_{\rho\delta}\rangle+\text{H.c.}$		1230
$i\langle W^{\mu\nu}u^{\lambda}h_{\mu}{}^{\rho}h_{\nu\rho}u_{\lambda}\rangle$		134	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u^{\delta}\rangle\langle u_{\nu}u_{\lambda}u_{\rho}h_{\sigma\delta}\rangle$		1231
$i\langle W^{\mu\nu}h_{\mu}{}^{\lambda}u_{\nu}u^{\rho}h_{\lambda\rho}\rangle+\text{H.c.}$		135	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u^{\delta}\rangle\langle u_{\nu}u_{\lambda}u_{\delta}h_{\rho\sigma}\rangle+\text{H.c.}$		1232
$i\langle W^{\mu\nu}h_{\mu}{}^{\lambda}u_{\lambda}u^{\rho}h_{\nu\rho}\rangle$		136	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u^{\delta}\rangle\langle u_{\nu}u_{\delta}u_{\lambda}h_{\rho\sigma}\rangle$		1233
$i\langle W^{\mu\nu}h_{\mu}{}^{\lambda}u^{\rho}u_{\nu}h_{\lambda\rho}\rangle+\text{H.c.}$		137	$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_{\sigma}u_{\mu}\rangle\langle u_{\nu}u_{\lambda}h_{\rho\delta}\rangle+\text{H.c.}$		1234
$i\langle W^{\mu\nu}h_{\mu}{}^{\lambda}u^{\rho}u_{\lambda}h_{\nu\rho}\rangle$		138	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_{\mu}h_{\nu}{}^{\sigma}\rangle\langle W_{\sigma}{}^{\delta}u_{\delta}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$		1235

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle W^{\mu\nu}h_\mu{}^\lambda u^\rho u_\rho h_{\nu\lambda}\rangle$		139	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu h_\nu{}^\sigma\rangle\langle W_\sigma{}^\delta u_\lambda u_\delta u_\rho\rangle$		1236
$i\langle W^{\mu\nu}u_\mu u_\nu u^\lambda\nabla^\rho f_{-\lambda\rho}\rangle+\text{H.c.}$	59	140	$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_\mu u_\nu\rangle\langle u_\sigma u_\lambda h_{\rho\delta}\rangle+\text{H.c.}$		1237
$i\langle W^{\mu\nu}u_\mu u^\lambda u_\nu\nabla^\rho f_{-\lambda\rho}\rangle+\text{H.c.}$	60	141	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u^\delta\rangle\langle W_{\mu\nu}u_\lambda u_\rho h_{\sigma\delta}\rangle+\text{H.c.}$		1238
$i\langle W^{\mu\nu}u_\mu u^\lambda u_\lambda\nabla^\rho f_{-\nu\rho}\rangle+\text{H.c.}$	61	142	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u_\sigma\rangle\langle W_{\mu\nu}u_\lambda u^\delta h_{\rho\delta}\rangle+\text{H.c.}$		1239
$i\langle W^{\mu\nu}u_\mu u^\lambda u^\rho\nabla_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$	62	143	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u^\delta\rangle\langle W_{\mu\nu}u_\lambda u_\sigma h_{\rho\delta}\rangle+\text{H.c.}$		1240
$i\langle W^{\mu\nu}u_\mu u^\lambda u^\rho\nabla_\lambda f_{-\nu\rho}\rangle+\text{H.c.}$	63	144	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda}u_\rho u^\delta h_{\sigma\delta}\rangle+\text{H.c.}$		1241
$i\langle W^{\mu\nu}u^\lambda u_\mu u_\nu\nabla^\rho f_{-\lambda\rho}\rangle+\text{H.c.}$		145	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u_\sigma\rangle\langle W_{\mu\nu}u^\delta u_\lambda h_{\rho\delta}\rangle+\text{H.c.}$		1242
$i\langle W^{\mu\nu}u^\lambda u_\mu u_\lambda\nabla^\rho f_{-\nu\rho}\rangle+\text{H.c.}$	64	146	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u^\delta\rangle\langle W_{\mu\nu}u_\sigma u_\lambda h_{\rho\delta}\rangle+\text{H.c.}$		1243
$i\langle W^{\mu\nu}u^\lambda u_\mu u^\rho\nabla_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$		147	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda}u^\delta u_\rho h_{\sigma\delta}\rangle+\text{H.c.}$		1244
$i\langle W^{\mu\nu}u^\lambda u_\lambda u_\mu\nabla^\rho f_{-\nu\rho}\rangle+\text{H.c.}$		148	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda}u^\delta u_\delta h_{\rho\sigma}\rangle+\text{H.c.}$		1245
$i\langle W^{\mu\nu}u_\mu u_\nu\nabla^\lambda f_{-\lambda}{}^\rho u_\rho\rangle+\text{H.c.}$		149	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda}u^\delta u_\sigma h_{\rho\delta}\rangle+\text{H.c.}$		1246
$i\langle W^{\mu\nu}u_\mu u^\lambda\nabla_\nu f_{-\lambda}{}^\rho u_\rho\rangle+\text{H.c.}$	65	150	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda}u_\sigma u^\delta h_{\rho\delta}\rangle+\text{H.c.}$		1247
$i\langle W^{\mu\nu}u_\mu u^\lambda\nabla_\lambda f_{-\nu}{}^\rho u_\rho\rangle+\text{H.c.}$		151	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\nu{}^\delta u_\delta u_\lambda h_{\rho\sigma}\rangle+\text{H.c.}$		1248
$i\langle W^{\mu\nu}u_\mu u^\lambda\nabla^\rho f_{-\nu\rho}u_\lambda\rangle+\text{H.c.}$		152	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\nu{}^\delta u_\lambda u_\delta h_{\rho\sigma}\rangle+\text{H.c.}$		1249
$i\langle W^{\mu\nu}u^\lambda u_\mu\nabla_\nu f_{-\lambda}{}^\rho u_\rho\rangle+\text{H.c.}$		153	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u_\sigma\rangle\langle W_\mu{}^\delta u_\nu u_\lambda h_{\rho\delta}\rangle+\text{H.c.}$		1250
$i\langle W^{\mu\nu}u_\mu u^\lambda u^\rho\nabla_\nu h_{\lambda\rho}\rangle+\text{H.c.}$	66	154	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\nu{}^\delta u_\lambda u_\rho h_{\sigma\delta}\rangle+\text{H.c.}$		1251
$i\langle W^{\mu\nu}u_\mu u^\lambda\nabla_\nu h_\lambda{}^\rho u_\rho\rangle+\text{H.c.}$		155	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\nu{}^\delta u_\lambda u_\sigma h_{\rho\delta}\rangle+\text{H.c.}$		1252
$i\langle W^{\mu\nu}\rangle\langle u_\mu u_\nu f_-{}^{\lambda\rho}f_{-\lambda\rho}\rangle$		156	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\sigma}u_\lambda u^\delta h_{\rho\delta}\rangle+\text{H.c.}$		1253
$i\langle f_-{}^{\mu\nu}f_{-\mu\nu}\rangle\langle W^{\lambda\rho}u_\lambda u_\rho\rangle$		157	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\nu{}^\delta u_\sigma u_\lambda h_{\rho\delta}\rangle+\text{H.c.}$		1254
$i\langle W^{\mu\nu}\rangle\langle u_\mu u^\lambda f_{-\nu}{}^\rho f_{-\lambda\rho}\rangle+\text{H.c.}$		158	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\sigma}u^\delta u_\lambda h_{\rho\delta}\rangle+\text{H.c.}$		1255
$i\langle W^{\mu\nu}u_\mu\rangle\langle u^\lambda f_{-\nu}{}^\rho f_{-\lambda\rho}\rangle+\text{H.c.}$		159	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\sigma{}^\delta u_\nu u_\lambda h_{\rho\delta}\rangle+\text{H.c.}$		1256
$i\langle f_-{}^{\mu\nu}f_{-\mu}{}^\lambda\rangle\langle W_\nu{}^\rho u_\rho u_\lambda\rangle+\text{H.c.}$		160	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda h_\rho{}^\sigma\rangle\langle u_\sigma u^\delta u_\delta\rangle+\text{H.c.}$		1257
$i\langle W^{\mu\nu}\rangle\langle u_\mu u^\lambda f_{-\lambda}{}^\rho f_{-\nu\rho}\rangle+\text{H.c.}$		161	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u_\sigma\rangle\langle W_{\mu\nu}u_\lambda h_\rho{}^\delta u_\delta\rangle+\text{H.c.}$		1258
$i\langle W^{\mu\nu}u^\lambda\rangle\langle u_\mu f_{-\nu}{}^\rho f_{-\lambda\rho}\rangle+\text{H.c.}$		162	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u^\delta\rangle\langle W_{\mu\nu}u_\lambda h_{\rho\sigma}u_\delta\rangle+\text{H.c.}$		1259
$i\langle W^{\mu\nu}\rangle\langle u^\lambda u_\lambda f_{-\mu}{}^\rho f_{-\nu\rho}\rangle$		163	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda h^{\sigma\delta}\rangle\langle u_\rho u_\sigma u_\delta\rangle+\text{H.c.}$		1260
$i\langle W^{\mu\nu}u^\lambda\rangle\langle u_\lambda f_{-\mu}{}^\rho f_{-\nu\rho}\rangle$		164	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u^\delta\rangle\langle W_{\mu\nu}u_\lambda h_{\sigma\delta}u_\rho\rangle$		1261
$i\langle W^{\mu\nu}\rangle\langle u^\lambda u^\rho f_{-\mu\nu}f_{-\lambda\rho}\rangle+\text{H.c.}$		165	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda}u_\rho h_\sigma{}^\delta u_\delta\rangle+\text{H.c.}$	527	1262
$i\langle W^{\mu\nu}u^\lambda\rangle\langle u^\rho f_{-\mu\nu}f_{-\lambda\rho}\rangle+\text{H.c.}$		166	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma h_{\lambda\sigma}\rangle\langle u_\rho u^\delta u_\delta\rangle+\text{H.c.}$		1263
$i\langle f_-{}^{\mu\nu}f_-{}^{\lambda\rho}\rangle\langle W_{\mu\nu}u_\lambda u_\rho\rangle$		167	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda}u^\delta h_{\rho\delta}u_\sigma\rangle+\text{H.c.}$	528	1264
$i\langle W^{\mu\nu}\rangle\langle u^\lambda u^\rho f_{-\mu\lambda}f_{-\nu\rho}\rangle$		168	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma h_\lambda{}^\delta\rangle\langle u_\rho u_\sigma u_\delta\rangle+\text{H.c.}$		1265
$i\langle W^{\mu\nu}u^\lambda\rangle\langle u^\rho f_{-\mu\lambda}f_{-\nu\rho}\rangle+\text{H.c.}$		169	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma h_\lambda{}^\delta\rangle\langle u_\rho u_\delta u_\sigma\rangle+\text{H.c.}$		1266
$i\langle f_-{}^{\mu\nu}f_-{}^{\lambda\rho}\rangle\langle W_{\mu\lambda}u_\nu u_\rho\rangle$		170	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma h_\sigma{}^\delta\rangle\langle u_\lambda u_\rho u_\delta\rangle+\text{H.c.}$		1267
$i\langle W^{\mu\nu}\rangle\langle u^\lambda u^\rho f_{-\mu\rho}f_{-\nu\lambda}\rangle$		171	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\sigma}u_\lambda h_\rho{}^\delta u_\delta\rangle+\text{H.c.}$		1268
$i\langle W^{\mu\nu}\rangle\langle u_\mu f_{-\nu}{}^\lambda u^\rho f_{-\lambda\rho}\rangle+\text{H.c.}$		172	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu h_{\lambda\sigma}\rangle\langle u_\rho u^\delta u_\delta\rangle+\text{H.c.}$		1269
$i\langle u^\mu f_{-\mu}{}^\nu\rangle\langle W^{\lambda\rho}u_\lambda f_{-\nu\rho}\rangle+\text{H.c.}$		173	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\nu{}^\delta u_\lambda h_{\rho\delta}u_\sigma\rangle+\text{H.c.}$		1270
$i\langle W^{\mu\nu}\rangle\langle u^\lambda f_{-\mu\nu}u^\rho f_{-\lambda\rho}\rangle$		174	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu h_\lambda{}^\delta\rangle\langle u_\rho u_\delta u_\sigma\rangle+\text{H.c.}$		1271
$i\langle u^\mu f_{-\mu}{}^\nu\rangle\langle W^{\lambda\rho}u_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$		175	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta h_{\sigma\delta}\rangle\langle u_\nu u_\lambda u_\rho\rangle+\text{H.c.}$		1272

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle W^{\mu\nu}\rangle\langle u_\mu u^\lambda f_{-\nu}{}^\rho h_{\lambda\rho}\rangle+\text{H.c.}$		176	$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_\sigma h_{\mu\delta}\rangle\langle u_\nu u_\lambda u_\rho\rangle+\text{H.c.}$		1273
$i\langle W^{\mu\nu}u_\mu\rangle\langle u^\lambda f_{-\nu}{}^\rho h_{\lambda\rho}\rangle+\text{H.c.}$		177	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}h_\lambda{}^\sigma\rangle\langle u_\rho u_\sigma u^\delta u_\delta\rangle+\text{H.c.}$		1274
$i\langle f_-{}^{\mu\nu}h_\mu{}^\lambda\rangle\langle W_\nu{}^\rho u_\rho u_\lambda\rangle+\text{H.c.}$		178	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u^\sigma f_{-\sigma}{}^\delta\rangle\langle u_\lambda u_\rho u_\delta\rangle$		1275
$i\langle W^{\mu\nu}\rangle\langle u_\mu u^\lambda f_{-\lambda}{}^\rho h_{\nu\rho}\rangle+\text{H.c.}$		179	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u^\sigma\rangle\langle u_\rho u^\delta f_{-\sigma\delta}\rangle+\text{H.c.}$		1276
$i\langle W^{\mu\nu}u_\mu\rangle\langle u^\lambda f_{-\lambda}{}^\rho h_{\nu\rho}\rangle+\text{H.c.}$		180	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u^\sigma\rangle\langle u_\sigma u^\delta f_{-\rho\delta}\rangle+\text{H.c.}$		1277
$i\langle f_-{}^{\mu\nu}h_\mu{}^\lambda\rangle\langle W_\lambda{}^\rho u_\rho u_\nu\rangle+\text{H.c.}$		181	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u^\sigma u_\sigma\rangle\langle u_\lambda u^\delta f_{-\rho\delta}\rangle+\text{H.c.}$	529	1278
$i\langle W^{\mu\nu}\rangle\langle u^\lambda u_\mu f_{-\nu}{}^\rho h_{\lambda\rho}\rangle+\text{H.c.}$		182	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma\rangle\langle u^\delta u_\delta\rangle\langle u_\sigma u_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$		1279
$i\langle W^{\mu\nu}u^\lambda\rangle\langle u_\mu f_{-\nu}{}^\rho h_{\lambda\rho}\rangle+\text{H.c.}$		183	$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}\rangle\langle u_\mu u_\sigma\rangle\langle u_\delta u_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$		1280
$i\langle W^{\mu\nu}\rangle\langle u^\lambda u_\mu f_{-\lambda}{}^\rho h_{\nu\rho}\rangle+\text{H.c.}$		184	$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}\rangle\langle u_\mu f_{-\sigma\delta}\rangle\langle u_\nu u_\lambda u_\rho\rangle$		1281
$i\langle W^{\mu\nu}u^\lambda\rangle\langle u_\mu f_{-\lambda}{}^\rho h_{\nu\rho}\rangle+\text{H.c.}$		185	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u^\sigma h_\sigma{}^\delta\rangle\langle u_\lambda u_\rho u_\delta\rangle$		1282
$i\langle W^{\mu\nu}\rangle\langle u^\lambda u_\lambda f_{-\mu}{}^\rho h_{\nu\rho}\rangle+\text{H.c.}$		186	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u^\sigma\rangle\langle u_\rho u^\delta h_{\sigma\delta}\rangle+\text{H.c.}$		1283
$i\langle W^{\mu\nu}u^\lambda\rangle\langle u_\lambda f_{-\mu}{}^\rho h_{\nu\rho}\rangle+\text{H.c.}$		187	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u^\sigma\rangle\langle u_\sigma u^\delta h_{\rho\delta}\rangle+\text{H.c.}$		1284
$i\langle W^{\mu\nu}\rangle\langle u^\lambda u^\rho f_{-\mu\nu}h_{\lambda\rho}\rangle+\text{H.c.}$		188	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u^\sigma u_\sigma\rangle\langle u_\lambda u^\delta h_{\rho\delta}\rangle+\text{H.c.}$		1285
$i\langle W^{\mu\nu}u^\lambda\rangle\langle u^\rho f_{-\mu\nu}h_{\lambda\rho}\rangle+\text{H.c.}$		189	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u^\sigma u^\delta\rangle\langle u_\lambda u_\rho h_{\sigma\delta}\rangle$		1286
$i\langle W^{\mu\nu}\rangle\langle u^\lambda u^\rho f_{-\mu\lambda}h_{\nu\rho}\rangle+\text{H.c.}$		190	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma\rangle\langle u_\nu u_\sigma\rangle\langle u_\lambda u^\delta h_{\rho\delta}\rangle+\text{H.c.}$		1287
$i\langle W^{\mu\nu}u^\lambda\rangle\langle u^\rho f_{-\mu\lambda}h_{\nu\rho}\rangle+\text{H.c.}$		191	$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}\rangle\langle u_\mu u_\sigma\rangle\langle u_\nu u_\lambda h_{\rho\delta}\rangle$		1288
$i\langle f_-{}^{\mu\nu}h^{\lambda\rho}\rangle\langle W_{\mu\lambda}u_\nu u_\rho\rangle+\text{H.c.}$		192	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda\rho}u^\sigma u^\delta f_{-\sigma\delta}\rangle+\text{H.c.}$	530	1289
$i\langle W^{\mu\nu}\rangle\langle u^\lambda u^\rho f_{-\mu\rho}h_{\nu\lambda}\rangle+\text{H.c.}$		193	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma u_\rho u^\delta f_{-\sigma\delta}\rangle+\text{H.c.}$	531	1290
$i\langle W^{\mu\nu}u^\lambda\rangle\langle u^\rho f_{-\mu\rho}h_{\nu\lambda}\rangle+\text{H.c.}$		194	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma u_\sigma u^\delta f_{-\rho\delta}\rangle+\text{H.c.}$	532	1291
$i\langle W^{\mu\nu}\rangle\langle u_\mu f_{-\nu}{}^\lambda u^\rho h_{\lambda\rho}\rangle+\text{H.c.}$		195	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma u^\delta u_\rho f_{-\sigma\delta}\rangle+\text{H.c.}$	533	1292
$i\langle u^\mu h_\mu{}^\nu\rangle\langle W^{\lambda\rho}u_\lambda f_{-\nu\rho}\rangle+\text{H.c.}$		196	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma u^\delta u_\sigma f_{-\rho\delta}\rangle+\text{H.c.}$	534	1293
$i\langle W^{\mu\nu}\rangle\langle u_\mu f_-{}^{\lambda\rho}u_\lambda h_{\nu\rho}\rangle+\text{H.c.}$		197	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma u^\delta u_\delta f_{-\rho\sigma}\rangle+\text{H.c.}$	535	1294
$i\langle u^\mu h^{\nu\lambda}\rangle\langle W_\nu{}^\rho u_\rho f_{-\mu\lambda}\rangle+\text{H.c.}$		198	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_+{}^{\sigma\delta}u_\lambda u_\rho f_{-\sigma\delta}\rangle+\text{H.c.}$	536	1295
$i\langle W^{\mu\nu}\rangle\langle u^\lambda f_{-\mu\lambda}u^\rho h_{\nu\rho}\rangle+\text{H.c.}$		199	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_+{}^{\sigma\delta}u_\lambda u_\sigma f_{-\rho\delta}\rangle+\text{H.c.}$	537	1296
$i\langle u^\mu h_\mu{}^\nu\rangle\langle W_\nu{}^\lambda u^\rho f_{-\lambda\rho}\rangle+\text{H.c.}$		200	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_+{}^{\sigma\delta}u_\sigma u_\lambda f_{-\rho\delta}\rangle+\text{H.c.}$	538	1297
$i\langle W^{\mu\nu}\rangle\langle u_\mu u_\nu h^{\lambda\rho}h_{\lambda\rho}\rangle$		201	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu\lambda}u_\sigma u^\delta f_{-\rho\delta}\rangle+\text{H.c.}$		1298
$i\langle h^{\mu\nu}h_{\mu\nu}\rangle\langle W^{\lambda\rho}u_\lambda u_\rho\rangle$		202	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_+{}^{\sigma\delta}u_\sigma u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$	539	1299
$i\langle W^{\mu\nu}\rangle\langle u_\mu u^\lambda h_\nu{}^\rho h_{\lambda\rho}\rangle+\text{H.c.}$		203	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu\lambda}u_\rho u^\delta f_{-\sigma\delta}\rangle+\text{H.c.}$		1300
$i\langle W^{\mu\nu}u_\mu\rangle\langle u^\lambda h_\nu{}^\rho h_{\lambda\rho}\rangle+\text{H.c.}$		204	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu\sigma}u^\delta u_\lambda f_{-\rho\delta}\rangle+\text{H.c.}$		1301
$i\langle h^{\mu\nu}h_\mu{}^\lambda\rangle\langle W_\nu{}^\rho u_\rho u_\lambda\rangle+\text{H.c.}$		205	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu}{}^\delta u_\lambda u_\delta f_{-\rho\sigma}\rangle+\text{H.c.}$	540	1302
$i\langle W^{\mu\nu}\rangle\langle u_\mu u^\lambda h_\lambda{}^\rho h_{\nu\rho}\rangle+\text{H.c.}$		206	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu\sigma}u^\delta u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$	541	1303
$i\langle W^{\mu\nu}u^\lambda\rangle\langle u_\mu h_\nu{}^\rho h_{\lambda\rho}\rangle+\text{H.c.}$		207	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\sigma}{}^\delta u_\nu u_\lambda f_{-\rho\delta}\rangle+\text{H.c.}$	542	1304
$i\langle W^{\mu\nu}\rangle\langle u^\lambda u_\lambda h_\mu{}^\rho h_{\nu\rho}\rangle$		208	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\sigma}{}^\delta u_\nu u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$	543	1305
$i\langle W^{\mu\nu}u^\lambda\rangle\langle u_\lambda h_\mu{}^\rho h_{\nu\rho}\rangle$		209	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\sigma}{}^\delta u_\delta u_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$	544	1306
$i\langle W^{\mu\nu}\rangle\langle u^\lambda u^\rho h_{\mu\lambda}h_{\nu\rho}\rangle$		210	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu\lambda}u^\delta u_\delta f_{-\rho\sigma}\rangle+\text{H.c.}$	545	
$i\langle W^{\mu\nu}u^\lambda\rangle\langle u^\rho h_{\mu\lambda}h_{\nu\rho}\rangle+\text{H.c.}$		211	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu}{}^\delta u_\sigma u_\lambda f_{-\rho\delta}\rangle+\text{H.c.}$	546	
$i\langle W^{\mu\nu}\rangle\langle u_\mu h_\nu{}^\lambda u^\rho h_{\lambda\rho}\rangle+\text{H.c.}$		212	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu}{}^\delta u_\delta u_\lambda f_{-\rho\sigma}\rangle+\text{H.c.}$	547	

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle u^\mu h_\mu{}^\nu\rangle\langle W^{\lambda\rho}u_\lambda h_{\nu\rho}\rangle+\text{H.c.}$		213	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu}{}^\delta u_\lambda u_\sigma f_{-\rho\delta}\rangle+\text{H.c.}$	548	
$i\langle W^{\mu\nu}\rangle\langle u_\mu u_\nu u^\lambda\nabla^\rho f_{-\lambda\rho}\rangle+\text{H.c.}$		214	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu\lambda}u^\delta u_\sigma f_{-\rho\delta}\rangle+\text{H.c.}$		1307
$i\langle W^{\mu\nu}u_\mu\rangle\langle u_\nu u^\lambda\nabla^\rho f_{-\lambda\rho}\rangle+\text{H.c.}$		215	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu\lambda}u^\delta u_\rho f_{-\sigma\delta}\rangle+\text{H.c.}$		1308
$i\langle u^\mu\nabla^\nu f_{-\mu\nu}\rangle\langle W^{\lambda\rho}u_\lambda u_\rho\rangle$		216	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu}{}^\delta u_\sigma u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$		1309
$i\langle W^{\mu\nu}\rangle\langle u_\mu u^\lambda u_\nu\nabla^\rho f_{-\lambda\rho}\rangle$		217	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}f_{+\sigma\delta}u_\mu u_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$	549	1310
$i\langle u^\mu\nabla^\nu f_{-\nu}{}^\lambda\rangle\langle W_\mu{}^\rho u_\rho u_\lambda\rangle+\text{H.c.}$		218	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}f_{+\mu\sigma}u_\delta u_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$	550	
$i\langle W^{\mu\nu}\rangle\langle u_\mu u^\lambda u^\rho\nabla_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$		219	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}f_{+\mu\nu}u_\sigma u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$		1311
$i\langle W^{\mu\nu}u_\mu\rangle\langle u^\lambda u^\rho\nabla_\nu f_{-\lambda\rho}\rangle$		220	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}f_{+\mu\nu}u_\lambda u_\rho f_{-\sigma\delta}\rangle+\text{H.c.}$		1312
$i\langle W^{\mu\nu}\nabla_\mu f_{-\nu}{}^\lambda\nabla^\rho f_{-\lambda\rho}\rangle+\text{H.c.}$	67	221	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda\rho}u^\sigma f_{-\sigma}{}^\delta u_\delta\rangle+\text{H.c.}$	551	1313
$i\langle W^{\mu\nu}\nabla_\mu f_-{}^{\lambda\rho}\nabla_\nu f_{-\lambda\rho}\rangle$	68	222	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma u_\rho f_{-\sigma}{}^\delta u_\delta\rangle+\text{H.c.}$	552	1314
$i\langle W^{\mu\nu}\nabla^\lambda f_{-\mu\lambda}\nabla^\rho f_{-\nu\rho}\rangle$	69	223	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma u_\sigma f_{-\rho}{}^\delta u_\delta\rangle+\text{H.c.}$	553	1315
$i\langle W^{\mu\nu}\nabla^\lambda f_{-\mu}{}^\rho\nabla_\nu h_{\lambda\rho}\rangle+\text{H.c.}$	70	224	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma u^\delta f_{-\rho\sigma}u_\delta\rangle+\text{H.c.}$	554	1316
$i\langle W^{\mu\nu}\nabla_\mu h^{\lambda\rho}\nabla_\nu h_{\lambda\rho}\rangle$	71	225	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma u^\delta f_{-\rho\delta}u_\sigma\rangle+\text{H.c.}$	555	1317
$i\langle W^{\mu\nu}f_{-\mu}{}^\lambda\nabla_\lambda\nabla^\rho f_{-\nu\rho}\rangle+\text{H.c.}$		226	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma u^\delta f_{-\sigma\delta}u_\rho\rangle+\text{H.c.}$	556	1318
$i\langle W^{\mu\nu}\nabla^\lambda\nabla^\rho f_{-\mu\lambda}h_{\nu\rho}\rangle+\text{H.c.}$	72	227	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_+{}^{\sigma\delta}u_\lambda f_{-\rho\sigma}u_\delta\rangle+\text{H.c.}$	557	1319
$i\langle W^{\mu\nu}f_{-\mu}{}^\lambda\nabla_\lambda\nabla^\rho h_{\nu\rho}\rangle+\text{H.c.}$		228	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_+{}^{\sigma\delta}u_\lambda f_{-\sigma\delta}u_\rho\rangle+\text{H.c.}$		1320
$i\langle W^{\mu\nu}h_\mu{}^\lambda\nabla_\lambda\nabla^\rho h_{\nu\rho}\rangle+\text{H.c.}$		229	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu\lambda}u_\rho f_{-\sigma}{}^\delta u_\delta\rangle+\text{H.c.}$	558	1321
$i\langle W^{\mu\nu}u^\lambda\nabla_\mu\nabla_\lambda\nabla^\rho f_{-\nu\rho}\rangle+\text{H.c.}$	73	230	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_+{}^{\sigma\delta}u_\sigma f_{-\lambda\rho}u_\delta\rangle+\text{H.c.}$		1322
$i\langle W^{\mu\nu}u^\lambda\nabla_\lambda\nabla^\rho\nabla_\rho f_{-\mu\nu}\rangle+\text{H.c.}$	74	231	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_+{}^{\sigma\delta}u_\sigma f_{-\lambda\delta}u_\rho\rangle+\text{H.c.}$	559	1323
$i\langle W^{\mu\nu}u^\lambda\nabla_\mu\nabla_\lambda\nabla^\rho h_{\nu\rho}\rangle+\text{H.c.}$	75	232	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu\sigma}u_\lambda f_{-\rho}{}^\delta u_\delta\rangle+\text{H.c.}$	560	1324
$\langle W^{\mu\nu}f_{+\mu\nu}u^\lambda u_\lambda u^\rho u_\rho\rangle+\text{H.c.}$	76	233	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu\sigma}u^\delta f_{-\lambda\rho}u_\delta\rangle+\text{H.c.}$	561	1325
$\langle W^{\mu\nu}f_{+\mu\nu}u^\lambda u^\rho u_\lambda u_\rho\rangle+\text{H.c.}$	77	234	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu\sigma}u^\delta f_{-\lambda\delta}u_\rho\rangle+\text{H.c.}$		1326
$\langle W^{\mu\nu}f_{+\mu\nu}u^\lambda u^\rho u_\rho u_\lambda\rangle+\text{H.c.}$		235	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\sigma}{}^\delta u_\nu f_{-\lambda\rho}u_\delta\rangle+\text{H.c.}$	562	1327
$\langle W^{\mu\nu}f_{+\mu}{}^\lambda u_\nu u_\lambda u^\rho u_\rho\rangle+\text{H.c.}$	78	236	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\sigma}{}^\delta u_\nu f_{-\lambda\delta}u_\rho\rangle+\text{H.c.}$		1328
$\langle W^{\mu\nu}f_{+\mu}{}^\lambda u_\nu u^\rho u_\lambda u_\rho\rangle+\text{H.c.}$	79	237	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\sigma}{}^\delta u_\delta f_{-\nu\lambda}u_\rho\rangle+\text{H.c.}$	563	1329
$\langle W^{\mu\nu}f_{+\mu}{}^\lambda u_\nu u^\rho u_\rho u_\lambda\rangle+\text{H.c.}$		238	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu\lambda}u_\sigma f_{-\rho}{}^\delta u_\delta\rangle+\text{H.c.}$	564	1330
$\langle W^{\mu\nu}f_{+\mu}{}^\lambda u_\lambda u_\nu u^\rho u_\rho\rangle+\text{H.c.}$	80	239	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu\lambda}u^\delta f_{-\rho\sigma}u_\delta\rangle+\text{H.c.}$	565	
$\langle W^{\mu\nu}f_{+\mu}{}^\lambda u_\lambda u^\rho u_\nu u_\rho\rangle+\text{H.c.}$	81	240	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu}{}^\delta u_\sigma f_{-\lambda\delta}u_\rho\rangle+\text{H.c.}$	566	
$\langle W^{\mu\nu}f_{+\mu}{}^\lambda u_\lambda u^\rho u_\rho u_\nu\rangle+\text{H.c.}$		241	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu}{}^\delta u_\lambda f_{-\rho\sigma}u_\delta\rangle+\text{H.c.}$	567	
$\langle W^{\mu\nu}f_{+\mu}{}^\lambda u^\rho u_\nu u_\lambda u_\rho\rangle+\text{H.c.}$		242	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu}{}^\delta u_\delta f_{-\lambda\sigma}u_\rho\rangle+\text{H.c.}$	568	
$\langle W^{\mu\nu}f_{+\mu}{}^\lambda u^\rho u_\nu u_\rho u_\lambda\rangle+\text{H.c.}$	82	243	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}f_{+\mu\sigma}u_\delta f_{-\nu\lambda}u_\rho\rangle+\text{H.c.}$	569	
$\langle W^{\mu\nu}f_{+\mu}{}^\lambda u^\rho u_\lambda u_\nu u_\rho\rangle+\text{H.c.}$		244	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu\lambda}u^\delta f_{-\sigma\delta}u_\rho\rangle+\text{H.c.}$		1331
$\langle W^{\mu\nu}f_{+\mu}{}^\lambda u^\rho u_\lambda u_\rho u_\nu\rangle+\text{H.c.}$		245	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu\lambda}u^\delta f_{-\rho\delta}u_\sigma\rangle+\text{H.c.}$		1332
$\langle W^{\mu\nu}f_{+\mu}{}^\lambda u^\rho u_\rho u_\nu u_\lambda\rangle+\text{H.c.}$		246	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu}{}^\delta u_\sigma f_{-\lambda\rho}u_\delta\rangle+\text{H.c.}$		1333
$\langle W^{\mu\nu}f_{+\mu}{}^\lambda u^\rho u_\rho u_\lambda u_\nu\rangle+\text{H.c.}$		247	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu}{}^\delta u_\delta f_{-\lambda\rho}u_\sigma\rangle+\text{H.c.}$		1334
$\langle W^{\mu\nu}f_+{}^{\lambda\rho}u_\mu u_\nu u_\lambda u_\rho\rangle+\text{H.c.}$	83	248	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}f_{+\mu\sigma}u_\nu f_{-\lambda\rho}u_\delta\rangle+\text{H.c.}$		1335
$\langle W^{\mu\nu}f_+{}^{\lambda\rho}u_\mu u_\lambda u_\nu u_\rho\rangle+\text{H.c.}$	84	249	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}f_{+\mu\nu}u_\sigma f_{-\lambda\rho}u_\delta\rangle+\text{H.c.}$		1336

Continued on next page

Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle W^{\mu\nu} f_+^{\lambda\rho} u_\mu u_\lambda u_\rho u_\nu\rangle + \text{H.c.}$		250	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta} f_{+\mu\nu} u_\lambda f_{-\sigma\delta} u_\rho\rangle + \text{H.c.}$		1337
$\langle W^{\mu\nu} f_+^{\lambda\rho} u_\lambda u_\mu u_\nu u_\rho\rangle + \text{H.c.}$		251	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} f_{+\lambda\rho} f_-^{\sigma\delta} u_\sigma u_\delta\rangle + \text{H.c.}$		1338
$\langle W^{\mu\nu} f_+^{\lambda\rho} u_\lambda u_\mu u_\rho u_\nu\rangle + \text{H.c.}$		252	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} f_{+\lambda}{}^{\sigma} f_{-\rho\sigma} u^\delta u_\delta\rangle + \text{H.c.}$	570	1339
$\langle W^{\mu\nu} f_+^{\lambda\rho} u_\lambda u_\rho u_\mu u_\nu\rangle + \text{H.c.}$		253	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} f_{+\lambda}{}^{\sigma} f_{-\rho}{}^{\delta} u_\sigma u_\delta\rangle + \text{H.c.}$		1340
$\langle W^{\mu\nu} u_\mu f_{+\nu}{}^{\lambda} u_\lambda u^\rho u_\rho\rangle + \text{H.c.}$	85	254	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} f_{+\lambda}{}^{\sigma} f_{-\rho}{}^{\delta} u_\delta u_\sigma\rangle + \text{H.c.}$		1341
$\langle W^{\mu\nu} u_\mu f_{+\nu}{}^{\lambda} u^\rho u_\lambda u_\rho\rangle + \text{H.c.}$	86	255	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} f_{+\lambda}{}^{\sigma} f_{-\sigma}{}^{\delta} u_\rho u_\delta\rangle + \text{H.c.}$		1342
$\langle W^{\mu\nu} u_\mu f_{+\nu}{}^{\lambda} u^\rho u_\rho u_\lambda\rangle + \text{H.c.}$		256	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} f_{+\lambda}{}^{\sigma} f_{-\sigma}{}^{\delta} u_\delta u_\rho\rangle + \text{H.c.}$		1343
$\langle W^{\mu\nu} u_\mu f_+^{\lambda\rho} u_\nu u_\lambda u_\rho\rangle + \text{H.c.}$	87	257	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} f_+^{\sigma\delta} f_{-\lambda\rho} u_\sigma u_\delta\rangle + \text{H.c.}$		1344
$\langle W^{\mu\nu} u_\mu f_+^{\lambda\rho} u_\lambda u_\nu u_\rho\rangle + \text{H.c.}$		258	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} f_+^{\sigma\delta} f_{-\lambda\sigma} u_\rho u_\delta\rangle + \text{H.c.}$	571	1345
$\langle W^{\mu\nu} u_\mu f_+^{\lambda\rho} u_\lambda u_\rho u_\nu\rangle + \text{H.c.}$		259	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} f_+^{\sigma\delta} f_{-\lambda\sigma} u_\delta u_\rho\rangle + \text{H.c.}$	572	1346
$\langle W^{\mu\nu} u^\lambda f_{+\mu\nu} u_\lambda u^\rho u_\rho\rangle + \text{H.c.}$	88	260	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^{\sigma} f_{+\nu\lambda} f_{-\rho\sigma} u^\delta u_\delta\rangle + \text{H.c.}$	573	1347
$\langle W^{\mu\nu} u^\lambda f_{+\mu\nu} u^\rho u_\lambda u_\rho\rangle + \text{H.c.}$	89	261	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^{\sigma} f_{+\nu\sigma} f_{-\lambda\rho} u^\delta u_\delta\rangle + \text{H.c.}$	574	
$\langle W^{\mu\nu} u^\lambda f_{+\mu\lambda} u_\nu u^\rho u_\rho\rangle + \text{H.c.}$		262	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} f_+^{\sigma\delta} f_{-\sigma\delta} u_\lambda u_\rho\rangle + \text{H.c.}$		1348
$\langle W^{\mu\nu} u^\lambda f_{+\mu\nu} u^\rho u_\rho u_\lambda\rangle + \text{H.c.}$		263	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^{\sigma} f_{+\nu\lambda} f_{-\sigma}{}^{\delta} u_\delta u_\rho\rangle + \text{H.c.}$		1349
$\langle W^{\mu\nu} u^\lambda f_{+\mu\lambda} u^\rho u_\nu u_\rho\rangle + \text{H.c.}$	90	264	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^{\sigma} f_{+\nu\sigma} f_{-\lambda}{}^{\delta} u_\rho u_\delta\rangle + \text{H.c.}$		1350
$\langle W^{\mu\nu} u^\lambda f_{+\mu}{}^{\rho} u_\nu u_\lambda u_\rho\rangle + \text{H.c.}$	91	265	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^{\sigma} f_{+\nu\sigma} f_{-\lambda}{}^{\delta} u_\delta u_\rho\rangle + \text{H.c.}$		1351
$\langle W^{\mu\nu} u^\lambda f_{+\mu\lambda} u^\rho u_\rho u_\nu\rangle + \text{H.c.}$		266	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^{\sigma} f_{+\sigma}{}^{\delta} f_{-\nu\lambda} u_\rho u_\delta\rangle + \text{H.c.}$	575	1352
$\langle W^{\mu\nu} u^\lambda f_{+\mu}{}^{\rho} u_\lambda u_\nu u_\rho\rangle + \text{H.c.}$		267	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^{\sigma} f_{+\sigma}{}^{\delta} f_{-\nu\lambda} u_\delta u_\rho\rangle + \text{H.c.}$	576	1353
$\langle W^{\mu\nu} u^\lambda f_{+\mu}{}^{\rho} u_\nu u_\rho u_\lambda\rangle + \text{H.c.}$		268	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^{\sigma} f_{+\sigma}{}^{\delta} f_{-\nu\delta} u_\lambda u_\rho\rangle + \text{H.c.}$		1354
$\langle W^{\mu\nu} u^\lambda f_{+\mu}{}^{\rho} u_\lambda u_\rho u_\nu\rangle + \text{H.c.}$		269	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^{\sigma} f_{+\nu\lambda} f_{-\sigma}{}^{\delta} u_\rho u_\delta\rangle + \text{H.c.}$		1355
$\langle W^{\mu\nu} u^\lambda f_{+\mu}{}^{\rho} u_\rho u_\nu u_\lambda\rangle + \text{H.c.}$		270	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^{\sigma} f_{+\nu\lambda} f_{-\rho}{}^{\delta} u_\sigma u_\delta\rangle + \text{H.c.}$		1356
$\langle W^{\mu\nu} u^\lambda f_{+\mu}{}^{\rho} u_\rho u_\lambda u_\nu\rangle + \text{H.c.}$		271	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^{\sigma} f_{+\nu\lambda} f_{-\rho}{}^{\delta} u_\delta u_\sigma\rangle + \text{H.c.}$		1357
$\langle W^{\mu\nu} u^\lambda f_{+\lambda}{}^{\rho} u_\mu u_\nu u_\rho\rangle + \text{H.c.}$		272	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^{\sigma} f_{+\nu}{}^{\delta} f_{-\lambda\sigma} u_\rho u_\delta\rangle + \text{H.c.}$	577	1358
$\langle W^{\mu\nu} u^\lambda f_{+\lambda}{}^{\rho} u_\mu u_\rho u_\nu\rangle + \text{H.c.}$		273	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^{\sigma} f_{+\nu}{}^{\delta} f_{-\lambda\sigma} u_\delta u_\rho\rangle + \text{H.c.}$	578	1359
$\langle W^{\mu\nu} u^\lambda f_{+\lambda}{}^{\rho} u_\rho u_\mu u_\nu\rangle + \text{H.c.}$		274	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^{\sigma} f_{+\nu}{}^{\delta} f_{-\sigma\delta} u_\lambda u_\rho\rangle + \text{H.c.}$		1360
$\langle W^{\mu\nu} u_\mu u_\nu f_+^{\lambda\rho} u_\lambda u_\rho\rangle + \text{H.c.}$	92	275	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^{\sigma} f_{+\nu}{}^{\delta} f_{-\lambda\rho} u_\delta u_\sigma\rangle + \text{H.c.}$		1361
$\langle W^{\mu\nu} u_\mu u^\lambda f_{+\nu\lambda} u^\rho u_\rho\rangle + \text{H.c.}$		276	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta} f_{+\sigma\delta} f_{-\mu\nu} u_\lambda u_\rho\rangle + \text{H.c.}$		1362
$\langle W^{\mu\nu} u_\mu u^\lambda f_{+\nu}{}^{\rho} u_\lambda u_\rho\rangle + \text{H.c.}$	93	277	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta} f_{+\mu\sigma} f_{-\nu\lambda} u_\rho u_\delta\rangle + \text{H.c.}$		1363
$\langle W^{\mu\nu} u_\mu u^\lambda f_{+\nu}{}^{\rho} u_\rho u_\lambda\rangle + \text{H.c.}$		278	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta} f_{+\mu\nu} f_{-\sigma\delta} u_\lambda u_\rho\rangle + \text{H.c.}$		1364
$\langle W^{\mu\nu} u_\mu u^\lambda f_{+\lambda}{}^{\rho} u_\nu u_\rho\rangle + \text{H.c.}$		279	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta} f_{+\mu\nu} f_{-\lambda\sigma} u_\rho u_\delta\rangle + \text{H.c.}$		1365
$\langle W^{\mu\nu} u_\mu u^\lambda f_{+\lambda}{}^{\rho} u_\rho u_\nu\rangle$		280	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta} f_{+\mu\nu} f_{-\lambda\rho} u_\sigma u_\delta\rangle + \text{H.c.}$		1366
$\langle W^{\mu\nu} u^\lambda u_\mu f_{+\nu\lambda} u^\rho u_\rho\rangle + \text{H.c.}$		281	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda f_{+\rho}{}^{\sigma} u^\delta f_{-\sigma\delta}\rangle + \text{H.c.}$	579	1367
$\langle W^{\mu\nu} u^\lambda u_\mu f_{+\nu}{}^{\rho} u_\lambda u_\rho\rangle + \text{H.c.}$		282	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda f_+^{\sigma\delta} u_\rho f_{-\sigma\delta}\rangle + \text{H.c.}$	580	1368
$\langle W^{\mu\nu} u^\lambda u_\mu f_{+\nu}{}^{\rho} u_\rho u_\lambda\rangle + \text{H.c.}$		283	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda f_+^{\sigma\delta} u_\sigma f_{-\rho\delta}\rangle + \text{H.c.}$	581	1369
$\langle W^{\mu\nu} u^\lambda u_\mu f_{+\lambda}{}^{\rho} u_\nu u_\rho\rangle$		284	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma f_{+\lambda\rho} u^\delta f_{-\sigma\delta}\rangle + \text{H.c.}$	582	1370
$\langle W^{\mu\nu} u^\lambda u_\lambda f_{+\mu\nu} u^\rho u_\rho\rangle$		285	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma f_{+\lambda\sigma} u^\delta f_{-\rho\delta}\rangle + \text{H.c.}$	583	1371
$\langle W^{\mu\nu} u^\lambda u^\rho f_{+\mu\nu} u_\lambda u_\rho\rangle$	94	286	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma f_{+\lambda}{}^{\delta} u_\rho f_{-\sigma\delta}\rangle + \text{H.c.}$	584	1372

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle W^{\mu\nu}u^{\lambda}u^{\rho}f_{+\mu\nu}u_{\rho}u_{\lambda}\rangle$		287	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^{\sigma}f_{+\lambda}{}^{\delta}u_{\sigma}f_{-\rho\delta}\rangle+\text{H.c.}$	585	1373
$\langle W^{\mu\nu}\rangle\langle f_{+\mu\nu}u^{\lambda}u_{\lambda}u^{\rho}u_{\rho}\rangle$	95	288	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^{\sigma}f_{+\lambda}{}^{\delta}u_{\delta}f_{-\rho\sigma}\rangle+\text{H.c.}$	586	1374
$\langle W^{\mu\nu}f_{+\mu\nu}\rangle\langle u^{\lambda}u_{\lambda}u^{\rho}u_{\rho}\rangle$		289	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^{\sigma}f_{+\sigma}{}^{\delta}u_{\lambda}f_{-\rho\delta}\rangle+\text{H.c.}$	587	1375
$\langle W^{\mu\nu}f_{+\mu\nu}u^{\lambda}\rangle\langle u_{\lambda}u^{\rho}u_{\rho}\rangle+\text{H.c.}$		290	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^{\sigma}f_{+\sigma}{}^{\delta}u_{\delta}f_{-\lambda\rho}\rangle+\text{H.c.}$	588	1376
$\langle u^{\mu}u_{\mu}\rangle\langle W^{\nu\lambda}f_{+\nu\lambda}u^{\rho}u_{\rho}\rangle+\text{H.c.}$		291	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\sigma}f_{+\nu\lambda}u^{\delta}f_{-\rho\delta}\rangle+\text{H.c.}$		1377
$\langle W^{\mu\nu}\rangle\langle f_{+\mu\nu}u^{\lambda}u^{\rho}u_{\lambda}u_{\rho}\rangle$		292	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\sigma}f_{+\nu}{}^{\delta}u_{\lambda}f_{-\rho\delta}\rangle+\text{H.c.}$	589	1378
$\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^{\lambda}u_{\nu}u_{\lambda}u^{\rho}u_{\rho}\rangle+\text{H.c.}$	96	293	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\sigma}f_{+\nu}{}^{\delta}u_{\delta}f_{-\lambda\rho}\rangle+\text{H.c.}$		1379
$\langle W^{\mu\nu}f_{+\mu\nu}\rangle\langle u^{\lambda}u^{\rho}u_{\lambda}u_{\rho}\rangle$		294	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\nu}f_{+\lambda\sigma}u^{\delta}f_{-\rho\delta}\rangle+\text{H.c.}$		1380
$\langle W^{\mu\nu}\rangle\langle f_{+\mu\nu}u^{\lambda}u^{\rho}u_{\rho}u_{\lambda}\rangle$		295	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\nu}f_{+\sigma}{}^{\delta}u_{\lambda}f_{-\rho\delta}\rangle+\text{H.c.}$	590	1381
$\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}\rangle\langle u_{\nu}u_{\lambda}u^{\rho}u_{\rho}\rangle+\text{H.c.}$		296	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\nu}f_{+\sigma}{}^{\delta}u_{\delta}f_{-\lambda\rho}\rangle+\text{H.c.}$	591	1382
$\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}u_{\nu}\rangle\langle u_{\lambda}u^{\rho}u_{\rho}\rangle+\text{H.c.}$		297	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\nu}f_{+\lambda}{}^{\delta}u_{\delta}f_{-\rho\sigma}\rangle+\text{H.c.}$	592	
$\langle u^{\mu}u_{\mu}\rangle\langle W^{\nu\lambda}f_{+\nu}{}^{\rho}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$		298	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\nu}f_{+\lambda\rho}u^{\delta}f_{-\sigma\delta}\rangle+\text{H.c.}$		1383
$\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^{\lambda}u_{\nu}u^{\rho}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$		299	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\nu}f_{+\lambda}{}^{\delta}u_{\sigma}f_{-\rho\delta}\rangle+\text{H.c.}$		1384
$\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}\rangle\langle u_{\nu}u^{\rho}u_{\lambda}u_{\rho}\rangle$		300	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u^{\delta}f_{+\nu\sigma}u_{\lambda}f_{-\rho\delta}\rangle+\text{H.c.}$		1385
$\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^{\lambda}u_{\nu}u^{\rho}u_{\rho}u_{\lambda}\rangle+\text{H.c.}$		301	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u^{\delta}f_{+\nu\sigma}u_{\delta}f_{-\lambda\rho}\rangle+\text{H.c.}$	593	1386
$\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^{\lambda}u_{\lambda}u_{\nu}u^{\rho}u_{\rho}\rangle+\text{H.c.}$		302	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u^{\delta}f_{+\sigma\delta}u_{\nu}f_{-\lambda\rho}\rangle+\text{H.c.}$	594	1387
$\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}u_{\lambda}\rangle\langle u_{\nu}u^{\rho}u_{\rho}\rangle+\text{H.c.}$		303	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u^{\delta}f_{+\nu\lambda}u_{\delta}f_{-\rho\sigma}\rangle+\text{H.c.}$	595	
$\langle u^{\mu}u_{\mu}\rangle\langle W^{\nu\lambda}f_{+\nu}{}^{\rho}u_{\rho}u_{\lambda}\rangle+\text{H.c.}$		304	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u^{\delta}f_{+\nu\delta}u_{\lambda}f_{-\rho\sigma}\rangle+\text{H.c.}$	596	
$\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^{\lambda}u_{\lambda}u^{\rho}u_{\nu}u_{\rho}\rangle+\text{H.c.}$		305	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_{\sigma}f_{+\mu\delta}u_{\nu}f_{-\lambda\rho}\rangle+\text{H.c.}$	597	
$\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^{\lambda}u^{\rho}u_{\nu}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$		306	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u^{\delta}f_{+\nu\lambda}u_{\rho}f_{-\sigma\delta}\rangle+\text{H.c.}$		1388
$\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}u^{\rho}\rangle\langle u_{\nu}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$		307	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_{\sigma}f_{+\mu\nu}u_{\delta}f_{-\lambda\rho}\rangle+\text{H.c.}$		1389
$\langle W^{\mu\nu}\rangle\langle f_{+}{}^{\lambda\rho}u_{\mu}u_{\nu}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$		308	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_{\mu}f_{+\sigma\delta}u_{\nu}f_{-\lambda\rho}\rangle+\text{H.c.}$	598	1390
$\langle W^{\mu\nu}f_{+}{}^{\lambda\rho}\rangle\langle u_{\mu}u_{\nu}u_{\lambda}u_{\rho}\rangle$		309	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_{\mu}f_{+\nu\lambda}u_{\rho}f_{-\sigma\delta}\rangle+\text{H.c.}$		1391
$\langle W^{\mu\nu}f_{+}{}^{\lambda\rho}u_{\mu}\rangle\langle u_{\nu}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$		310	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_{\lambda}f_{+\rho}{}^{\sigma}f_{-\sigma}{}^{\delta}u_{\delta}\rangle+\text{H.c.}$	599	1392
$\langle W^{\mu\nu}\rangle\langle f_{+}{}^{\lambda\rho}u_{\mu}u_{\lambda}u_{\nu}u_{\rho}\rangle+\text{H.c.}$		311	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_{\lambda}f_{+}{}^{\sigma\delta}f_{-\rho\sigma}u_{\delta}\rangle+\text{H.c.}$	600	1393
$\langle u^{\mu}u^{\nu}\rangle\langle W_{\mu}{}^{\lambda}f_{+\nu}{}^{\rho}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$		312	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_{\lambda}f_{+}{}^{\sigma\delta}f_{-\sigma\delta}u_{\rho}\rangle+\text{H.c.}$		1394
$\langle W^{\mu\nu}\rangle\langle f_{+}{}^{\lambda\rho}u_{\mu}u_{\lambda}u_{\rho}u_{\nu}\rangle$		313	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^{\sigma}f_{+\lambda\rho}f_{-\sigma}{}^{\delta}u_{\delta}\rangle+\text{H.c.}$	601	1395
$\langle W^{\mu\nu}u_{\mu}\rangle\langle f_{+\nu}{}^{\lambda}u_{\lambda}u^{\rho}u_{\rho}\rangle+\text{H.c.}$		314	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^{\sigma}f_{+\lambda\sigma}f_{-\rho}{}^{\delta}u_{\delta}\rangle+\text{H.c.}$	602	1396
$\langle W^{\mu\nu}u^{\lambda}\rangle\langle f_{+\mu\nu}u_{\lambda}u^{\rho}u_{\rho}\rangle+\text{H.c.}$		315	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^{\sigma}f_{+\lambda}{}^{\delta}f_{-\rho\sigma}u_{\delta}\rangle+\text{H.c.}$	603	1397
$\langle W^{\mu\nu}u^{\lambda}\rangle\langle f_{+\mu\lambda}u_{\nu}u^{\rho}u_{\rho}\rangle+\text{H.c.}$		316	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^{\sigma}f_{+\lambda}{}^{\delta}f_{-\rho\delta}u_{\sigma}\rangle+\text{H.c.}$	604	1398
$\langle W^{\mu\nu}u^{\lambda}\rangle\langle f_{+\mu}{}^{\rho}u_{\nu}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$		317	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^{\sigma}f_{+\lambda}{}^{\delta}f_{-\sigma\delta}u_{\rho}\rangle+\text{H.c.}$	605	1399
$\langle W^{\mu\nu}u_{\mu}u^{\lambda}\rangle\langle f_{+\nu\lambda}u^{\rho}u_{\rho}\rangle+\text{H.c.}$		318	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^{\sigma}f_{+\sigma}{}^{\delta}f_{-\lambda\rho}u_{\delta}\rangle+\text{H.c.}$		1400
$\langle W^{\mu\nu}u_{\mu}u^{\lambda}\rangle\langle f_{+\nu}{}^{\rho}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$		319	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^{\sigma}f_{+\sigma}{}^{\delta}f_{-\lambda\delta}u_{\rho}\rangle+\text{H.c.}$	606	1401
$\langle W^{\mu\nu}f_{+\mu\nu}f_{-}{}^{\lambda\rho}f_{-\lambda\rho}\rangle+\text{H.c.}$	97	320	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\sigma}f_{+\nu\lambda}f_{-\rho}{}^{\delta}u_{\delta}\rangle+\text{H.c.}$		1402
$\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}f_{-\nu}{}^{\rho}f_{-\lambda\rho}\rangle+\text{H.c.}$	98	321	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\sigma}f_{+\nu}{}^{\delta}f_{-\lambda\rho}u_{\delta}\rangle+\text{H.c.}$		1403
$\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}f_{-\lambda}{}^{\rho}f_{-\nu\rho}\rangle+\text{H.c.}$	99	322	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\sigma}f_{+\nu}{}^{\delta}f_{-\lambda\delta}u_{\rho}\rangle+\text{H.c.}$		1404

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle W^{\mu\nu} f_+^{\lambda\rho} f_{-\mu\nu} f_{-\lambda\rho}\rangle + \text{H.c.}$	100	323	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta f_{+\nu\lambda} f_{-\rho\sigma} u_\delta\rangle + \text{H.c.}$	607	1405
$\langle W^{\mu\nu} f_+^{\lambda\rho} f_{-\mu\lambda} f_{-\nu\rho}\rangle + \text{H.c.}$	101	324	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu f_{+\lambda\sigma} f_{-\rho}{}^\delta u_\delta\rangle + \text{H.c.}$		1406
$\langle W^{\mu\nu} f_+^{\lambda\rho} f_{-\lambda\rho} f_{-\mu\nu}\rangle + \text{H.c.}$	102	325	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu f_{+\sigma}{}^\delta f_{-\lambda\rho} u_\delta\rangle + \text{H.c.}$	608	1407
$\langle W^{\mu\nu} f_{-\mu\nu} f_+^{\lambda\rho} f_{-\lambda\rho}\rangle + \text{H.c.}$	103	326	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu f_{+\lambda}{}^\delta f_{-\rho\sigma} u_\delta\rangle + \text{H.c.}$	609	
$\langle W^{\mu\nu} f_{-\mu}{}^\lambda f_{+\nu}{}^\rho f_{-\lambda\rho}\rangle + \text{H.c.}$	104	327	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta f_{+\nu\sigma} f_{-\lambda\rho} u_\delta\rangle + \text{H.c.}$	610	
$\langle W^{\mu\nu} f_{-\mu}{}^\lambda f_{+\lambda}{}^\rho f_{-\nu\rho}\rangle$	105	328	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu f_{+\sigma}{}^\delta f_{-\lambda\delta} u_\rho\rangle + \text{H.c.}$		1408
$\langle W^{\mu\nu} f_-^{\lambda\rho} f_{+\mu\nu} f_{-\lambda\rho}\rangle$	106	329	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu f_{+\lambda\rho} f_{-\sigma}{}^\delta u_\delta\rangle + \text{H.c.}$		1409
$\langle W^{\mu\nu} f_{+\mu}{}^\lambda f_{-\nu}{}^\rho h_{\lambda\rho}\rangle + \text{H.c.}$	107	330	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu f_{+\lambda}{}^\delta f_{-\sigma\delta} u_\rho\rangle + \text{H.c.}$		1410
$\langle W^{\mu\nu} f_{+\mu}{}^\lambda f_{-\lambda}{}^\rho h_{\nu\rho}\rangle + \text{H.c.}$	108	331	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta f_{+\nu\sigma} f_{-\lambda\delta} u_\rho\rangle + \text{H.c.}$		1411
$\langle W^{\mu\nu} f_+^{\lambda\rho} f_{-\mu\lambda} h_{\nu\rho}\rangle + \text{H.c.}$	109	332	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta f_{+\sigma\delta} f_{-\nu\lambda} u_\rho\rangle + \text{H.c.}$	611	1412
$\langle W^{\mu\nu} f_{+\mu}{}^\lambda h_\nu{}^\rho f_{-\lambda\rho}\rangle + \text{H.c.}$	110	333	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta f_{+\nu\delta} f_{-\lambda\sigma} u_\rho\rangle + \text{H.c.}$	612	
$\langle W^{\mu\nu} f_{+\mu}{}^\lambda h_\lambda{}^\rho f_{-\nu\rho}\rangle + \text{H.c.}$	111	334	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta f_{+\nu\lambda} f_{-\sigma\delta} u_\rho\rangle + \text{H.c.}$		1413
$\langle W^{\mu\nu} f_+^{\lambda\rho} h_{\mu\lambda} f_{-\nu\rho}\rangle + \text{H.c.}$	112	335	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta} u_\mu f_{+\nu\lambda} f_{-\sigma\delta} u_\rho\rangle + \text{H.c.}$		1414
$\langle W^{\mu\nu} f_{-\mu}{}^\lambda f_{+\nu}{}^\rho h_{\lambda\rho}\rangle + \text{H.c.}$	113	336	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u_\rho f_+^{\sigma\delta} f_{-\sigma\delta}\rangle + \text{H.c.}$		1415
$\langle W^{\mu\nu} f_{-\mu}{}^\lambda f_{+\lambda}{}^\rho h_{\nu\rho}\rangle + \text{H.c.}$	114	337	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma f_{+\rho}{}^\delta f_{-\sigma\delta}\rangle + \text{H.c.}$		1416
$\langle W^{\mu\nu} f_-^{\lambda\rho} f_{+\mu\lambda} h_{\nu\rho}\rangle + \text{H.c.}$	115	338	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma f_{+\sigma}{}^\delta f_{-\rho\delta}\rangle + \text{H.c.}$	613	1417
$\langle W^{\mu\nu} f_{+\mu\nu} h^{\lambda\rho} h_{\lambda\rho}\rangle + \text{H.c.}$	116	339	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u_\lambda f_{+\rho}{}^\delta f_{-\sigma\delta}\rangle + \text{H.c.}$		1418
$\langle W^{\mu\nu} f_{+\mu}{}^\lambda h_\nu{}^\rho h_{\lambda\rho}\rangle + \text{H.c.}$	117	340	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u_\lambda f_{+\sigma}{}^\delta f_{-\rho\delta}\rangle + \text{H.c.}$	614	1419
$\langle W^{\mu\nu} f_{+\mu}{}^\lambda h_\lambda{}^\rho h_{\nu\rho}\rangle + \text{H.c.}$	118	341	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u_\sigma f_{+\lambda}{}^\delta f_{-\rho\delta}\rangle + \text{H.c.}$	615	1420
$\langle W^{\mu\nu} f_+^{\lambda\rho} h_{\mu\lambda} h_{\nu\rho}\rangle + \text{H.c.}$	119	342	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u^\delta f_{+\lambda\rho} f_{-\sigma\delta}\rangle + \text{H.c.}$		1421
$\langle W^{\mu\nu} h_\mu{}^\lambda f_{+\nu}{}^\rho h_{\lambda\rho}\rangle + \text{H.c.}$	120	343	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u^\delta f_{+\lambda\sigma} f_{-\rho\delta}\rangle + \text{H.c.}$		1422
$\langle W^{\mu\nu} h_\mu{}^\lambda f_{+\lambda}{}^\rho h_{\nu\rho}\rangle$	121	344	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u^\delta f_{+\lambda\delta} f_{-\rho\sigma}\rangle + \text{H.c.}$		1423
$\langle W^{\mu\nu} h^{\lambda\rho} f_{+\mu\nu} h_{\lambda\rho}\rangle$	122	345	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u^\delta f_{+\sigma\delta} f_{-\lambda\rho}\rangle + \text{H.c.}$		1424
$\langle W^{\mu\nu} \nabla_\mu f_{+\nu}{}^\lambda u^\rho f_{-\lambda\rho}\rangle + \text{H.c.}$	123	346	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u_\nu f_{+\lambda}{}^\delta f_{-\rho\delta}\rangle + \text{H.c.}$		1425
$\langle W^{\mu\nu} \nabla_\mu f_+^{\lambda\rho} u_\nu f_{-\lambda\rho}\rangle + \text{H.c.}$	124	347	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u^\delta f_{+\nu\lambda} f_{-\rho\delta}\rangle + \text{H.c.}$		1426
$\langle W^{\mu\nu} \nabla_\mu f_+^{\lambda\rho} u_\lambda f_{-\nu\rho}\rangle + \text{H.c.}$	125	348	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u^\delta f_{+\nu\delta} f_{-\lambda\rho}\rangle + \text{H.c.}$		1427
$\langle W^{\mu\nu} \nabla^\lambda f_{+\mu\lambda} u^\rho f_{-\nu\rho}\rangle + \text{H.c.}$	126	349	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\sigma f_{+\lambda}{}^\delta f_{-\rho\delta}\rangle + \text{H.c.}$		1428
$\langle W^{\mu\nu} \nabla^\lambda f_{+\mu}{}^\rho u_\lambda f_{-\nu\rho}\rangle + \text{H.c.}$	127	350	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\lambda f_{+\sigma}{}^\delta f_{-\rho\delta}\rangle + \text{H.c.}$		1429
$\langle W^{\mu\nu} \nabla^\lambda f_{+\lambda}{}^\rho u_\mu f_{-\nu\rho}\rangle + \text{H.c.}$	128	351	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta f_{+\lambda\sigma} f_{-\rho\delta}\rangle + \text{H.c.}$		1430
$\langle W^{\mu\nu} \nabla^\lambda f_{+\lambda}{}^\rho u_\rho f_{-\mu\nu}\rangle + \text{H.c.}$	129	352	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta f_{+\sigma\delta} f_{-\lambda\rho}\rangle + \text{H.c.}$	616	1431
$\langle W^{\mu\nu} \nabla_\mu f_{+\nu}{}^\lambda f_{-\lambda}{}^\rho u_\rho\rangle + \text{H.c.}$	130	353	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta f_{+\lambda\delta} f_{-\rho\sigma}\rangle + \text{H.c.}$	617	
$\langle W^{\mu\nu} \nabla_\mu f_+^{\lambda\rho} f_{-\nu\lambda} u_\rho\rangle + \text{H.c.}$	131	354	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta f_{+\lambda\rho} f_{-\sigma\delta}\rangle + \text{H.c.}$		1432
$\langle W^{\mu\nu} \nabla_\mu f_+^{\lambda\rho} f_{-\lambda\rho} u_\nu\rangle + \text{H.c.}$	132	355	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\sigma f_{+\nu\lambda} f_{-\rho\delta}\rangle + \text{H.c.}$		1433
$\langle W^{\mu\nu} \nabla^\lambda f_{+\mu\lambda} f_{-\nu}{}^\rho u_\rho\rangle + \text{H.c.}$	133	356	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\nu f_{+\lambda\sigma} f_{-\rho\delta}\rangle + \text{H.c.}$		1434
$\langle W^{\mu\nu} \nabla^\lambda f_{+\mu}{}^\rho f_{-\nu\lambda} u_\rho\rangle + \text{H.c.}$	134	357	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\nu f_{+\sigma\delta} f_{-\lambda\rho}\rangle + \text{H.c.}$	618	1435
$\langle W^{\mu\nu} \nabla^\lambda f_{+\lambda}{}^\rho f_{-\mu\nu} u_\rho\rangle + \text{H.c.}$	135	358	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\nu f_{+\lambda\delta} f_{-\rho\sigma}\rangle + \text{H.c.}$	619	

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle W^{\mu\nu}\nabla^{\lambda}f_{+\lambda}{}^{\rho}f_{-\mu\rho}u_{\nu}\rangle+\text{H.c.}$	136	359	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u^{\delta}u_{\delta}f_{+\nu\sigma}f_{-\lambda\rho}\rangle+\text{H.c.}$	620	
$\langle W^{\mu\nu}u_{\mu}\nabla_{\nu}f_{+}{}^{\lambda\rho}f_{-\lambda\rho}\rangle+\text{H.c.}$	137	360	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u^{\delta}u_{\delta}f_{+\nu\lambda}f_{-\rho\sigma}\rangle+\text{H.c.}$	621	
$\langle W^{\mu\nu}u_{\mu}\nabla^{\lambda}f_{+\lambda}{}^{\rho}f_{-\nu\rho}\rangle+\text{H.c.}$	138	361	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u^{\delta}u_{\nu}f_{+\lambda\rho}f_{-\sigma\delta}\rangle+\text{H.c.}$		1436
$\langle W^{\mu\nu}u^{\lambda}\nabla_{\mu}f_{+\nu}{}^{\rho}f_{-\lambda\rho}\rangle+\text{H.c.}$	139	362	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_{\sigma}u_{\delta}f_{+\mu\nu}f_{-\lambda\rho}\rangle+\text{H.c.}$		1437
$\langle W^{\mu\nu}u^{\lambda}\nabla_{\mu}f_{+\lambda}{}^{\rho}f_{-\nu\rho}\rangle+\text{H.c.}$	140	363	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_{\mu}u_{\nu}f_{+\sigma\delta}f_{-\lambda\rho}\rangle+\text{H.c.}$		1438
$\langle W^{\mu\nu}u^{\lambda}\nabla_{\lambda}f_{+\mu}{}^{\rho}f_{-\nu\rho}\rangle+\text{H.c.}$	141	364	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda\rho}u^{\sigma}u^{\delta}h_{\sigma\delta}\rangle+\text{H.c.}$	622	1439
$\langle W^{\mu\nu}u^{\lambda}\nabla^{\rho}f_{+\mu\rho}f_{-\nu\lambda}\rangle+\text{H.c.}$	142	365	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}u_{\rho}u^{\delta}h_{\sigma\delta}\rangle+\text{H.c.}$	623	1440
$\langle W^{\mu\nu}u^{\lambda}\nabla^{\rho}f_{+\lambda\rho}f_{-\mu\nu}\rangle+\text{H.c.}$	143	366	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}u_{\sigma}u^{\delta}h_{\rho\delta}\rangle+\text{H.c.}$	624	1441
$\langle W^{\mu\nu}\nabla_{\mu}f_{+\nu}{}^{\lambda}u^{\rho}h_{\lambda\rho}\rangle+\text{H.c.}$	144	367	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}u^{\delta}u_{\rho}h_{\sigma\delta}\rangle+\text{H.c.}$	625	1442
$\langle W^{\mu\nu}\nabla_{\mu}f_{+}{}^{\lambda\rho}u_{\lambda}h_{\nu\rho}\rangle+\text{H.c.}$	145	368	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}u^{\delta}u_{\sigma}h_{\rho\delta}\rangle+\text{H.c.}$	626	1443
$\langle W^{\mu\nu}\nabla^{\lambda}f_{+\mu\lambda}u^{\rho}h_{\nu\rho}\rangle+\text{H.c.}$	146	369	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}u^{\delta}u_{\delta}h_{\rho\sigma}\rangle+\text{H.c.}$	627	1444
$\langle W^{\mu\nu}\nabla^{\lambda}f_{+\mu}{}^{\rho}u_{\nu}h_{\lambda\rho}\rangle+\text{H.c.}$	147	370	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+}{}^{\sigma\delta}u_{\lambda}u_{\sigma}h_{\rho\delta}\rangle+\text{H.c.}$	628	1445
$\langle W^{\mu\nu}\nabla^{\lambda}f_{+\mu}{}^{\rho}u_{\lambda}h_{\nu\rho}\rangle+\text{H.c.}$	148	371	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+}{}^{\sigma\delta}u_{\sigma}u_{\lambda}h_{\rho\delta}\rangle+\text{H.c.}$	629	1446
$\langle W^{\mu\nu}\nabla_{\mu}f_{+\nu}{}^{\lambda}h_{\lambda}{}^{\rho}u_{\rho}\rangle+\text{H.c.}$	149	372	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\nu\lambda}u_{\sigma}u^{\delta}h_{\rho\delta}\rangle+\text{H.c.}$		1447
$\langle W^{\mu\nu}\nabla_{\mu}f_{+}{}^{\lambda\rho}h_{\nu\lambda}u_{\rho}\rangle+\text{H.c.}$	150	373	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\nu\sigma}u_{\lambda}u^{\delta}h_{\rho\delta}\rangle+\text{H.c.}$		1448
$\langle W^{\mu\nu}\nabla^{\lambda}f_{+\mu\lambda}h_{\nu}{}^{\rho}u_{\rho}\rangle+\text{H.c.}$	151	374	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\nu\sigma}u^{\delta}u_{\lambda}h_{\rho\delta}\rangle+\text{H.c.}$		1449
$\langle W^{\mu\nu}\nabla^{\lambda}f_{+\mu}{}^{\rho}h_{\nu\lambda}u_{\rho}\rangle+\text{H.c.}$	152	375	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\nu}{}^{\delta}u_{\lambda}u_{\delta}h_{\rho\sigma}\rangle+\text{H.c.}$		1450
$\langle W^{\mu\nu}\nabla^{\lambda}f_{+\mu}{}^{\rho}h_{\lambda\rho}u_{\nu}\rangle+\text{H.c.}$	153	376	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\nu\lambda}u^{\delta}u_{\sigma}h_{\rho\delta}\rangle+\text{H.c.}$		1451
$\langle W^{\mu\nu}u_{\mu}\nabla^{\lambda}f_{+\nu}{}^{\rho}h_{\lambda\rho}\rangle+\text{H.c.}$	154	377	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\nu\lambda}u^{\delta}u_{\rho}h_{\sigma\delta}\rangle+\text{H.c.}$		1452
$\langle W^{\mu\nu}u_{\mu}\nabla^{\lambda}f_{+\lambda}{}^{\rho}h_{\nu\rho}\rangle+\text{H.c.}$	155	378	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\nu\lambda}u^{\delta}u_{\delta}h_{\rho\sigma}\rangle+\text{H.c.}$		1453
$\langle W^{\mu\nu}u^{\lambda}\nabla_{\mu}f_{+\nu}{}^{\rho}h_{\lambda\rho}\rangle+\text{H.c.}$	156	379	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}f_{+\mu\nu}u_{\sigma}u_{\lambda}h_{\rho\delta}\rangle+\text{H.c.}$		1454
$\langle W^{\mu\nu}u^{\lambda}\nabla_{\mu}f_{+\lambda}{}^{\rho}h_{\nu\rho}\rangle+\text{H.c.}$	157	380	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda\rho}u^{\sigma}h_{\sigma}{}^{\delta}u_{\delta}\rangle+\text{H.c.}$	630	1455
$\langle W^{\mu\nu}u^{\lambda}\nabla_{\lambda}f_{+\mu}{}^{\rho}h_{\nu\rho}\rangle+\text{H.c.}$	158	381	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}u_{\rho}h_{\sigma}{}^{\delta}u_{\delta}\rangle+\text{H.c.}$	631	1456
$\langle W^{\mu\nu}f_{+\mu\nu}u^{\lambda}\nabla^{\rho}f_{-\lambda\rho}\rangle+\text{H.c.}$	159	382	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}u_{\sigma}h_{\rho}{}^{\delta}u_{\delta}\rangle+\text{H.c.}$	632	1457
$\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}u_{\nu}\nabla^{\rho}f_{-\lambda\rho}\rangle+\text{H.c.}$	160	383	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}u^{\delta}h_{\rho\sigma}u_{\delta}\rangle+\text{H.c.}$	633	1458
$\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}u_{\lambda}\nabla^{\rho}f_{-\nu\rho}\rangle+\text{H.c.}$	161	384	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}u^{\delta}h_{\rho\delta}u_{\sigma}\rangle+\text{H.c.}$	634	1459
$\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}u^{\rho}\nabla_{\nu}f_{-\lambda\rho}\rangle+\text{H.c.}$	162	385	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}u^{\delta}h_{\sigma\delta}u_{\rho}\rangle+\text{H.c.}$	635	1460
$\langle W^{\mu\nu}f_{+\mu\nu}\nabla^{\lambda}f_{-\lambda}{}^{\rho}u_{\rho}\rangle+\text{H.c.}$	163	386	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+}{}^{\sigma\delta}u_{\lambda}h_{\rho\sigma}u_{\delta}\rangle+\text{H.c.}$	636	1461
$\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}\nabla_{\nu}f_{-\lambda}{}^{\rho}u_{\rho}\rangle+\text{H.c.}$	164	387	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+}{}^{\sigma\delta}u_{\sigma}h_{\lambda\delta}u_{\rho}\rangle+\text{H.c.}$		1462
$\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}\nabla^{\rho}f_{-\nu\rho}u_{\lambda}\rangle+\text{H.c.}$	165	388	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\nu\sigma}u_{\lambda}h_{\rho}{}^{\delta}u_{\delta}\rangle+\text{H.c.}$	637	1463
$\langle W^{\mu\nu}u_{\mu}f_{+\nu}{}^{\lambda}\nabla^{\rho}f_{-\lambda\rho}\rangle+\text{H.c.}$	166	389	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\nu\sigma}u^{\delta}h_{\lambda\delta}u_{\rho}\rangle+\text{H.c.}$		1464
$\langle W^{\mu\nu}u_{\mu}f_{+}{}^{\lambda\rho}\nabla_{\nu}f_{-\lambda\rho}\rangle+\text{H.c.}$	167	390	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\sigma}{}^{\delta}u_{\nu}h_{\lambda\delta}u_{\rho}\rangle+\text{H.c.}$		1465
$\langle W^{\mu\nu}u^{\lambda}f_{+\mu\nu}\nabla^{\rho}f_{-\lambda\rho}\rangle+\text{H.c.}$	168	391	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\nu\lambda}u_{\sigma}h_{\rho}{}^{\delta}u_{\delta}\rangle+\text{H.c.}$	638	1466
$\langle W^{\mu\nu}u^{\lambda}f_{+\mu\lambda}\nabla^{\rho}f_{-\nu\rho}\rangle+\text{H.c.}$	169	392	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\nu\lambda}u_{\rho}h_{\sigma}{}^{\delta}u_{\delta}\rangle+\text{H.c.}$		1467
$\langle W^{\mu\nu}\nabla_{\mu}\nabla^{\lambda}f_{+\nu}{}^{\rho}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$	170	393	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\nu\lambda}u^{\delta}h_{\rho\sigma}u_{\delta}\rangle+\text{H.c.}$	639	1468
$\langle W^{\mu\nu}\nabla^{\lambda}\nabla^{\rho}f_{+\mu\nu}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$	171	394	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\nu\lambda}u^{\delta}h_{\sigma\delta}u_{\rho}\rangle+\text{H.c.}$		1469
$\langle W^{\mu\nu}\nabla^{\lambda}\nabla^{\rho}f_{+\mu\lambda}u_{\nu}u_{\rho}\rangle+\text{H.c.}$	172	395	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\nu}{}^{\delta}u_{\sigma}h_{\lambda\delta}u_{\rho}\rangle+\text{H.c.}$	640	1470

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle W^{\mu\nu}\nabla^\lambda\nabla^\rho f_{+\mu\lambda}u_\rho u_\nu\rangle+\text{H.c.}$		396	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}f_{+\mu\nu}u_\sigma h_{\lambda\delta}u_\rho\rangle+\text{H.c.}$	641	1471
$\langle W^{\mu\nu}u_\mu\nabla_\nu\nabla^\lambda f_{+\lambda}{}^\rho u_\rho\rangle+\text{H.c.}$	173	397	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda\rho}h^{\sigma\delta}u_\sigma u_\delta\rangle+\text{H.c.}$		1472
$\langle W^{\mu\nu}u_\mu\nabla^\lambda\nabla^\rho f_{+\nu\lambda}u_\rho\rangle+\text{H.c.}$		398	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma h_{\rho\sigma}u^\delta u_\delta\rangle+\text{H.c.}$		1473
$\langle W^{\mu\nu}u^\lambda\nabla_\lambda\nabla^\rho f_{+\mu\nu}u_\rho\rangle$		399	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma h_\rho{}^\delta u_\sigma u_\delta\rangle+\text{H.c.}$		1474
$\langle W^{\mu\nu}\rangle\langle f_{+\mu\nu}f_-{}^{\lambda\rho}f_{-\lambda\rho}\rangle$	174	400	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma h_\rho{}^\delta u_\delta u_\sigma\rangle+\text{H.c.}$		1475
$\langle W^{\mu\nu}f_{+\mu\nu}\rangle\langle f_-{}^{\lambda\rho}f_{-\lambda\rho}\rangle$		401	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma h_\sigma{}^\delta u_\rho u_\delta\rangle+\text{H.c.}$		1476
$\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^\lambda f_-{}^\rho f_{-\lambda\rho}\rangle+\text{H.c.}$	175	402	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma h_\sigma{}^\delta u_\delta u_\rho\rangle+\text{H.c.}$		1477
$\langle W^{\mu\nu}f_{+\mu}{}^\lambda\rangle\langle f_-{}^\rho f_{-\lambda\rho}\rangle$		403	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_+{}^{\sigma\delta}h_{\lambda\sigma}u_\rho u_\delta\rangle+\text{H.c.}$		1478
$\langle W^{\mu\nu}\rangle\langle f_+{}^{\lambda\rho}f_{-\mu\nu}f_{-\lambda\rho}\rangle+\text{H.c.}$	176	404	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_+{}^{\sigma\delta}h_{\lambda\sigma}u_\delta u_\rho\rangle+\text{H.c.}$		1479
$\langle W^{\mu\nu}\rangle\langle f_+{}^{\lambda\rho}f_{-\mu\lambda}f_{-\nu\rho}\rangle$	177	405	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu\lambda}h_{\rho\sigma}u^\delta u_\delta\rangle+\text{H.c.}$		1480
$\langle W^{\mu\nu}f_+{}^{\lambda\rho}\rangle\langle f_{-\mu\nu}f_{-\lambda\rho}\rangle$		406	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu}{}^\delta h_{\lambda\sigma}u_\rho u_\delta\rangle+\text{H.c.}$	642	1481
$\langle W^{\mu\nu}f_+{}^{\lambda\rho}\rangle\langle f_{-\mu\lambda}f_{-\nu\rho}\rangle$		407	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}f_{+\mu\nu}h_{\lambda\sigma}u_\rho u_\delta\rangle+\text{H.c.}$	643	
$\langle W^{\mu\nu}f_{-\mu\nu}\rangle\langle f_+{}^{\lambda\rho}f_{-\lambda\rho}\rangle$		408	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu}{}^\delta h_{\lambda\sigma}u_\delta u_\rho\rangle+\text{H.c.}$		1482
$\langle W^{\mu\nu}f_{-\mu}{}^\lambda\rangle\langle f_{+\nu}{}^\rho f_{-\lambda\rho}\rangle$		409	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}f_{+\mu\nu}h_{\lambda\sigma}u_\delta u_\rho\rangle+\text{H.c.}$		1483
$\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^\lambda f_{-\nu}{}^\rho h_{\lambda\rho}\rangle+\text{H.c.}$	178	410	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda f_{+\rho}{}^\sigma u^\delta h_{\sigma\delta}\rangle+\text{H.c.}$	644	1484
$\langle W^{\mu\nu}f_{+\mu}{}^\lambda\rangle\langle f_{-\nu}{}^\rho h_{\lambda\rho}\rangle$		411	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda f_+{}^{\sigma\delta}u_\sigma h_{\rho\delta}\rangle+\text{H.c.}$	645	1485
$\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^\lambda f_{-\lambda}{}^\rho h_{\nu\rho}\rangle+\text{H.c.}$	179	412	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{+\lambda\rho}u^\delta h_{\sigma\delta}\rangle+\text{H.c.}$	646	1486
$\langle W^{\mu\nu}f_{+\mu}{}^\lambda\rangle\langle f_{-\lambda}{}^\rho h_{\nu\rho}\rangle$		413	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{+\lambda\sigma}u^\delta h_{\rho\delta}\rangle+\text{H.c.}$	647	1487
$\langle W^{\mu\nu}\rangle\langle f_+{}^{\lambda\rho}f_{-\mu\lambda}h_{\nu\rho}\rangle+\text{H.c.}$	180	414	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{+\lambda}{}^\delta u_\rho h_{\sigma\delta}\rangle+\text{H.c.}$	648	1488
$\langle W^{\mu\nu}f_+{}^{\lambda\rho}\rangle\langle f_{-\mu\lambda}h_{\nu\rho}\rangle$		415	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{+\lambda}{}^\delta u_\sigma h_{\rho\delta}\rangle+\text{H.c.}$	649	1489
$\langle W^{\mu\nu}f_{-\mu}{}^\lambda\rangle\langle f_{+\nu}{}^\rho h_{\lambda\rho}\rangle$		416	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{+\lambda}{}^\delta u_\delta h_{\rho\sigma}\rangle+\text{H.c.}$	650	1490
$\langle W^{\mu\nu}f_{-\mu}{}^\lambda\rangle\langle f_{+\lambda}{}^\rho h_{\nu\rho}\rangle$		417	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{+\sigma}{}^\delta u_\lambda h_{\rho\delta}\rangle+\text{H.c.}$	651	1491
$\langle W^{\mu\nu}f_-{}^{\lambda\rho}\rangle\langle f_{+\mu\lambda}h_{\nu\rho}\rangle$		418	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma f_{+\nu\lambda}u^\delta h_{\rho\delta}\rangle+\text{H.c.}$		1492
$\langle W^{\mu\nu}\rangle\langle f_{+\mu\nu}h^{\lambda\rho}h_{\lambda\rho}\rangle$	181	419	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma f_{+\nu}{}^\delta u_\lambda h_{\rho\delta}\rangle+\text{H.c.}$		1493
$\langle W^{\mu\nu}f_{+\mu\nu}\rangle\langle h^{\lambda\rho}h_{\lambda\rho}\rangle$		420	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu f_{+\lambda\sigma}u^\delta h_{\rho\delta}\rangle+\text{H.c.}$		1494
$\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^\lambda h_\nu{}^\rho h_{\lambda\rho}\rangle+\text{H.c.}$	182	421	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu f_{+\sigma}{}^\delta u_\lambda h_{\rho\delta}\rangle+\text{H.c.}$		1495
$\langle W^{\mu\nu}f_{+\mu}{}^\lambda\rangle\langle h_\nu{}^\rho h_{\lambda\rho}\rangle$		422	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu f_{+\lambda\rho}u^\delta h_{\sigma\delta}\rangle+\text{H.c.}$		1496
$\langle W^{\mu\nu}\rangle\langle f_+{}^{\lambda\rho}h_{\mu\lambda}h_{\nu\rho}\rangle$	183	423	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu f_{+\lambda}{}^\delta u_\sigma h_{\rho\delta}\rangle+\text{H.c.}$		1497
$\langle W^{\mu\nu}f_+{}^{\lambda\rho}\rangle\langle h_{\mu\lambda}h_{\nu\rho}\rangle$		424	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu f_{+\lambda}{}^\delta u_\delta h_{\rho\sigma}\rangle+\text{H.c.}$	652	1498
$\langle W^{\mu\nu}h_\mu{}^\lambda\rangle\langle f_{+\nu}{}^\rho h_{\lambda\rho}\rangle$		425	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta f_{+\nu\sigma}u_\lambda h_{\rho\delta}\rangle+\text{H.c.}$		1499
$\langle W^{\mu\nu}\rangle\langle\nabla_\mu f_{+\nu}{}^\lambda u^\rho f_{-\lambda\rho}\rangle+\text{H.c.}$	184	426	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta f_{+\nu\lambda}u_\sigma h_{\rho\delta}\rangle+\text{H.c.}$		1500
$\langle W^{\mu\nu}\nabla_\mu f_{+\nu}{}^\lambda\rangle\langle u^\rho f_{-\lambda\rho}\rangle$		427	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta f_{+\nu\lambda}u_\rho h_{\sigma\delta}\rangle+\text{H.c.}$		1501
$\langle W^{\mu\nu}\rangle\langle\nabla_\mu f_+{}^{\lambda\rho}u_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$	185	428	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta f_{+\nu\lambda}u_\delta h_{\rho\sigma}\rangle+\text{H.c.}$		1502
$\langle W^{\mu\nu}\nabla_\mu f_+{}^{\lambda\rho}\rangle\langle u_\nu f_{-\lambda\rho}\rangle$		429	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_\sigma f_{+\mu\nu}u_\lambda h_{\rho\delta}\rangle+\text{H.c.}$		1503
$\langle W^{\mu\nu}\rangle\langle\nabla_\mu f_+{}^{\lambda\rho}u_\lambda f_{-\nu\rho}\rangle+\text{H.c.}$	186	430	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_\mu f_{+\nu\lambda}u_\sigma h_{\rho\delta}\rangle+\text{H.c.}$		1504
$\langle W^{\mu\nu}\nabla_\mu f_+{}^{\lambda\rho}\rangle\langle u_\lambda f_{-\nu\rho}\rangle$		431	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda f_{+\rho}{}^\sigma h_\sigma{}^\delta u_\delta\rangle+\text{H.c.}$	653	1505

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle W^{\mu\nu}\rangle\langle\nabla^\lambda f_{+\mu\lambda}u^\rho f_{-\nu\rho}\rangle+\text{H.c.}$	187	432	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda f_+^{\ \sigma\delta}h_{\rho\sigma}u_\delta\rangle+\text{H.c.}$		1506
$\langle W^{\mu\nu}\nabla^\lambda f_{+\mu\lambda}\rangle\langle u^\rho f_{-\nu\rho}\rangle$		433	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{+\lambda\rho}h_\sigma^{\ \delta}u_\delta\rangle+\text{H.c.}$	654	1507
$\langle W^{\mu\nu}\rangle\langle\nabla^\lambda f_{+\mu}^{\ \ \rho}u_\lambda f_{-\nu\rho}\rangle+\text{H.c.}$	188	434	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{+\lambda\sigma}h_\rho^{\ \delta}u_\delta\rangle+\text{H.c.}$	655	1508
$\langle W^{\mu\nu}\nabla^\lambda f_{+\mu}^{\ \ \rho}\rangle\langle u_\lambda f_{-\nu\rho}\rangle$		435	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{+\lambda}^{\ \ \delta}h_{\rho\sigma}u_\delta\rangle+\text{H.c.}$	656	1509
$\langle W^{\mu\nu}\rangle\langle\nabla^\lambda f_{+\lambda}^{\ \ \rho}u_\mu f_{-\nu\rho}\rangle+\text{H.c.}$	189	436	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{+\lambda}^{\ \ \delta}h_{\rho\delta}u_\sigma\rangle+\text{H.c.}$	657	1510
$\langle W^{\mu\nu}\nabla^\lambda f_{+\lambda}^{\ \ \rho}\rangle\langle u_\mu f_{-\nu\rho}\rangle$		437	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{+\lambda}^{\ \ \delta}h_{\sigma\delta}u_\rho\rangle+\text{H.c.}$	658	1511
$\langle W^{\mu\nu}\rangle\langle\nabla^\lambda f_{+\lambda}^{\ \ \rho}u_\rho f_{-\mu\nu}\rangle+\text{H.c.}$	190	438	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{+\sigma}^{\ \ \delta}h_{\lambda\delta}u_\rho\rangle+\text{H.c.}$	659	1512
$\langle W^{\mu\nu}\nabla^\lambda f_{+\lambda}^{\ \ \rho}\rangle\langle u_\rho f_{-\mu\nu}\rangle$		439	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu^{\ \ \sigma}u_\sigma f_{+\nu\lambda}h_\rho^{\ \delta}u_\delta\rangle+\text{H.c.}$		1513
$\langle W^{\mu\nu}u_\mu\rangle\langle\nabla_\nu f_+^{\ \ \lambda\rho}f_{-\lambda\rho}\rangle$		440	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu^{\ \ \sigma}u_\sigma f_{+\nu}^{\ \ \delta}h_{\lambda\delta}u_\rho\rangle+\text{H.c.}$		1514
$\langle W^{\mu\nu}u_\mu\rangle\langle\nabla^\lambda f_{+\lambda}^{\ \ \rho}f_{-\nu\rho}\rangle$		441	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu^{\ \ \sigma}u^\delta f_{+\nu\lambda}h_{\rho\sigma}u_\delta\rangle+\text{H.c.}$		1515
$\langle W^{\mu\nu}u^\lambda\rangle\langle\nabla_\mu f_{+\nu}^{\ \ \rho}f_{-\lambda\rho}\rangle$		442	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu^{\ \ \sigma}u_\nu f_{+\lambda\sigma}h_\rho^{\ \delta}u_\delta\rangle+\text{H.c.}$		1516
$\langle W^{\mu\nu}u^\lambda\rangle\langle\nabla_\mu f_{+\lambda}^{\ \ \rho}f_{-\nu\rho}\rangle$		443	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu^{\ \ \sigma}u_\nu f_{+\sigma}^{\ \ \delta}h_{\lambda\delta}u_\rho\rangle+\text{H.c.}$		1517
$\langle W^{\mu\nu}u^\lambda\rangle\langle\nabla_\lambda f_{+\mu}^{\ \ \rho}f_{-\nu\rho}\rangle$		444	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu^{\ \ \sigma}u_\nu f_{+\lambda}^{\ \ \delta}h_{\rho\sigma}u_\delta\rangle+\text{H.c.}$	660	1518
$\langle W^{\mu\nu}u^\lambda\rangle\langle\nabla^\rho f_{+\mu\rho}f_{-\nu\lambda}\rangle$		445	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu^{\ \ \sigma}u_\nu f_{+\lambda}^{\ \ \delta}h_{\sigma\delta}u_\rho\rangle+\text{H.c.}$		1519
$\langle W^{\mu\nu}u^\lambda\rangle\langle\nabla^\rho f_{+\lambda\rho}f_{-\mu\nu}\rangle$		446	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu^{\ \ \sigma}u_\nu f_{+\lambda}^{\ \ \delta}h_{\rho\delta}u_\sigma\rangle+\text{H.c.}$		1520
$\langle W^{\mu\nu}\rangle\langle\nabla_\mu f_{+\nu}^{\ \ \lambda}u^\rho h_{\lambda\rho}\rangle+\text{H.c.}$	191	447	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu^{\ \ \sigma}u^\delta f_{+\nu\sigma}h_{\lambda\delta}u_\rho\rangle+\text{H.c.}$		1521
$\langle W^{\mu\nu}\nabla_\mu f_{+\nu}^{\ \ \lambda}\rangle\langle u^\rho h_{\lambda\rho}\rangle$		448	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu^{\ \ \sigma}u^\delta f_{+\nu\lambda}h_{\sigma\delta}u_\rho\rangle+\text{H.c.}$		1522
$\langle W^{\mu\nu}\rangle\langle\nabla_\mu f_+^{\ \ \lambda\rho}u_\lambda h_{\nu\rho}\rangle+\text{H.c.}$	192	449	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu^{\ \ \sigma}u^\delta f_{+\nu\lambda}h_{\rho\delta}u_\sigma\rangle+\text{H.c.}$		1523
$\langle W^{\mu\nu}\nabla_\mu f_+^{\ \ \lambda\rho}\rangle\langle u_\lambda h_{\nu\rho}\rangle$		450	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_\sigma f_{+\mu\nu}h_{\lambda\delta}u_\rho\rangle+\text{H.c.}$	661	1524
$\langle W^{\mu\nu}\rangle\langle\nabla^\lambda f_{+\mu\lambda}u^\rho h_{\nu\rho}\rangle+\text{H.c.}$	193	451	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_\mu f_{+\nu\lambda}h_{\rho\sigma}u_\delta\rangle+\text{H.c.}$	662	1525
$\langle W^{\mu\nu}\nabla^\lambda f_{+\mu\lambda}\rangle\langle u^\rho h_{\nu\rho}\rangle$		452	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu^{\ \ \sigma}u^\delta u_\delta f_{+\nu\lambda}h_{\rho\sigma}\rangle+\text{H.c.}$	663	
$\langle W^{\mu\nu}\rangle\langle\nabla^\lambda f_{+\mu}^{\ \ \rho}u_\nu h_{\lambda\rho}\rangle+\text{H.c.}$	194	453	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma f_{+\rho}^{\ \ \delta}h_{\sigma\delta}\rangle+\text{H.c.}$		1526
$\langle W^{\mu\nu}\nabla^\lambda f_{+\mu}^{\ \ \rho}\rangle\langle u_\nu h_{\lambda\rho}\rangle$		454	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma f_{+\sigma}^{\ \ \delta}h_{\rho\delta}\rangle+\text{H.c.}$		1527
$\langle W^{\mu\nu}\rangle\langle\nabla^\lambda f_{+\mu}^{\ \ \rho}u_\lambda h_{\nu\rho}\rangle+\text{H.c.}$	195	455	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda f_{+\rho}^{\ \ \delta}h_{\sigma\delta}\rangle+\text{H.c.}$		1528
$\langle W^{\mu\nu}\nabla^\lambda f_{+\mu}^{\ \ \rho}\rangle\langle u_\lambda h_{\nu\rho}\rangle$		456	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda f_{+\sigma}^{\ \ \delta}h_{\rho\delta}\rangle+\text{H.c.}$		1529
$\langle W^{\mu\nu}u_\mu\rangle\langle\nabla^\lambda f_{+\nu}^{\ \ \rho}h_{\lambda\rho}\rangle$		457	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\sigma f_{+\lambda}^{\ \ \delta}h_{\rho\delta}\rangle+\text{H.c.}$		1530
$\langle W^{\mu\nu}u_\mu\rangle\langle\nabla^\lambda f_{+\lambda}^{\ \ \rho}h_{\nu\rho}\rangle$		458	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u^\delta f_{+\lambda\rho}h_{\sigma\delta}\rangle+\text{H.c.}$		1531
$\langle W^{\mu\nu}u^\lambda\rangle\langle\nabla_\mu f_{+\nu}^{\ \ \rho}h_{\lambda\rho}\rangle$		459	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u^\delta f_{+\lambda\sigma}h_{\rho\delta}\rangle+\text{H.c.}$		1532
$\langle W^{\mu\nu}u^\lambda\rangle\langle\nabla_\mu f_{+\lambda}^{\ \ \rho}h_{\nu\rho}\rangle$		460	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u^\delta f_{+\lambda\delta}h_{\rho\sigma}\rangle+\text{H.c.}$		1533
$\langle W^{\mu\nu}u^\lambda\rangle\langle\nabla_\lambda f_{+\mu}^{\ \ \rho}h_{\nu\rho}\rangle$		461	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu^{\ \ \sigma}u_\sigma u_\nu f_{+\lambda}^{\ \ \delta}h_{\rho\delta}\rangle+\text{H.c.}$		1534
$\langle W^{\mu\nu}\rangle\langle f_{+\mu\nu}u^\lambda\nabla^\rho f_{-\lambda\rho}\rangle+\text{H.c.}$	196	462	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu^{\ \ \sigma}u_\sigma u^\delta f_{+\nu\lambda}h_{\rho\delta}\rangle+\text{H.c.}$		1535
$\langle W^{\mu\nu}f_{+\mu\nu}\rangle\langle u^\lambda\nabla^\rho f_{-\lambda\rho}\rangle$		463	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu^{\ \ \sigma}u_\nu u_\sigma f_{+\lambda}^{\ \ \delta}h_{\rho\delta}\rangle+\text{H.c.}$		1536
$\langle W^{\mu\nu}\rangle\langle f_{+\mu}^{\ \ \lambda}u_\nu\nabla^\rho f_{-\lambda\rho}\rangle+\text{H.c.}$	197	464	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu^{\ \ \sigma}u_\nu u_\lambda f_{+\sigma}^{\ \ \delta}h_{\rho\delta}\rangle+\text{H.c.}$		1537
$\langle W^{\mu\nu}f_{+\mu}^{\ \ \lambda}\rangle\langle u_\nu\nabla^\rho f_{-\lambda\rho}\rangle$		465	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu^{\ \ \sigma}u_\nu u_\lambda f_{+\rho}^{\ \ \delta}h_{\sigma\delta}\rangle+\text{H.c.}$		1538
$\langle W^{\mu\nu}\rangle\langle f_{+\mu}^{\ \ \lambda}u_\lambda\nabla^\rho f_{-\nu\rho}\rangle+\text{H.c.}$	198	466	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu^{\ \ \sigma}u_\nu u^\delta f_{+\lambda\sigma}h_{\rho\delta}\rangle+\text{H.c.}$		1539
$\langle W^{\mu\nu}f_{+\mu}^{\ \ \lambda}\rangle\langle u_\lambda\nabla^\rho f_{-\nu\rho}\rangle$		467	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu^{\ \ \sigma}u_\nu u^\delta f_{+\lambda\rho}h_{\sigma\delta}\rangle+\text{H.c.}$		1540

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^{\lambda}u^{\rho}\nabla_{\nu}f_{-\lambda\rho}\rangle+\text{H.c.}$	199	468	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u_{\nu}u^{\delta}f_{+\lambda\delta}h_{\rho\sigma}\rangle+\text{H.c.}$		1541
$\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}\rangle\langle u^{\rho}\nabla_{\nu}f_{-\lambda\rho}\rangle$		469	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u^{\delta}u_{\sigma}f_{+\nu\lambda}h_{\rho\delta}\rangle+\text{H.c.}$		1542
$\langle W^{\mu\nu}u_{\mu}\rangle\langle f_{+\nu}{}^{\lambda}\nabla^{\rho}f_{-\lambda\rho}\rangle$		470	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u^{\delta}u_{\nu}f_{+\lambda\rho}h_{\sigma\delta}\rangle+\text{H.c.}$		1543
$\langle W^{\mu\nu}u_{\mu}\rangle\langle f_{+}{}^{\lambda\rho}\nabla_{\nu}f_{-\lambda\rho}\rangle$		471	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla_{\lambda}f_{+\rho}{}^{\sigma}u_{\sigma}u^{\delta}u_{\delta}\rangle+\text{H.c.}$	664	1544
$\langle W^{\mu\nu}u^{\lambda}\rangle\langle f_{+\mu\nu}\nabla^{\rho}f_{-\lambda\rho}\rangle$		472	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla_{\lambda}f_{+\rho}{}^{\sigma}u^{\delta}u_{\delta}u_{\sigma}\rangle+\text{H.c.}$		1545
$\langle W^{\mu\nu}u^{\lambda}\rangle\langle f_{+\mu\lambda}\nabla^{\rho}f_{-\nu\rho}\rangle$		473	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla_{\lambda}f_{+}{}^{\sigma\delta}u_{\rho}u_{\sigma}u_{\delta}\rangle+\text{H.c.}$	665	1546
$\langle W^{\mu\nu}\rangle\langle\nabla_{\mu}\nabla^{\lambda}f_{+\nu}{}^{\rho}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$	200	474	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^{\sigma}f_{+\lambda\rho}u^{\delta}u_{\sigma}u_{\delta}\rangle+\text{H.c.}$		1547
$\langle W^{\mu\nu}\nabla_{\mu}\nabla^{\lambda}f_{+\nu}{}^{\rho}\rangle\langle u_{\lambda}u_{\rho}\rangle$		475	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^{\sigma}f_{+\lambda\rho}u^{\delta}u_{\delta}u_{\sigma}\rangle+\text{H.c.}$	666	1548
$\langle W^{\mu\nu}\rangle\langle\nabla^{\lambda}\nabla^{\rho}f_{+\mu\nu}u_{\lambda}u_{\rho}\rangle$		476	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla_{\lambda}f_{+}{}^{\sigma\delta}u_{\sigma}u_{\rho}u_{\delta}\rangle+\text{H.c.}$		1549
$i\langle W^{\mu\nu}f_{+\mu\nu}f_{+}{}^{\lambda\rho}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$	201	477	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla_{\lambda}f_{+}{}^{\sigma\delta}u_{\sigma}u_{\delta}u_{\rho}\rangle+\text{H.c.}$		1550
$i\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}f_{+\nu\lambda}u^{\rho}u_{\rho}\rangle+\text{H.c.}$	202	478	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^{\sigma}f_{+\lambda}{}^{\delta}u_{\rho}u_{\delta}u_{\sigma}\rangle+\text{H.c.}$	667	1551
$i\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}f_{+\nu}{}^{\rho}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$	203	479	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^{\sigma}f_{+\lambda\rho}u_{\sigma}u^{\delta}u_{\delta}\rangle+\text{H.c.}$		1552
$i\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}f_{+\nu}{}^{\rho}u_{\rho}u_{\lambda}\rangle+\text{H.c.}$	204	480	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^{\sigma}f_{+\lambda\sigma}u_{\rho}u^{\delta}u_{\delta}\rangle+\text{H.c.}$	668	1553
$i\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}f_{+\lambda}{}^{\rho}u_{\nu}u_{\rho}\rangle+\text{H.c.}$	205	481	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^{\sigma}f_{+\lambda\sigma}u^{\delta}u_{\rho}u_{\delta}\rangle+\text{H.c.}$	669	1554
$i\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}f_{+\lambda}{}^{\rho}u_{\rho}u_{\nu}\rangle+\text{H.c.}$	206	482	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^{\sigma}f_{+\lambda}{}^{\delta}u_{\rho}u_{\sigma}u_{\delta}\rangle+\text{H.c.}$		1555
$i\langle W^{\mu\nu}f_{+}{}^{\lambda\rho}f_{+\mu\nu}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$	207	483	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^{\sigma}f_{+\lambda\sigma}u^{\delta}u_{\delta}u_{\rho}\rangle+\text{H.c.}$		1556
$i\langle W^{\mu\nu}f_{+}{}^{\lambda\rho}f_{+\mu\lambda}u_{\nu}u_{\rho}\rangle+\text{H.c.}$	208	484	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^{\sigma}f_{+\lambda}{}^{\delta}u_{\sigma}u_{\rho}u_{\delta}\rangle+\text{H.c.}$	670	1557
$i\langle W^{\mu\nu}f_{+}{}^{\lambda\rho}f_{+\mu\lambda}u_{\rho}u_{\nu}\rangle+\text{H.c.}$		485	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^{\sigma}f_{+\lambda}{}^{\delta}u_{\sigma}u_{\delta}u_{\rho}\rangle+\text{H.c.}$		1558
$i\langle W^{\mu\nu}f_{+}{}^{\lambda\rho}f_{+\lambda\rho}u_{\mu}u_{\nu}\rangle+\text{H.c.}$	209	486	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^{\sigma}f_{+\lambda}{}^{\delta}u_{\delta}u_{\rho}u_{\sigma}\rangle+\text{H.c.}$		1559
$i\langle W^{\mu\nu}f_{+\mu\nu}u^{\lambda}f_{+\lambda}{}^{\rho}u_{\rho}\rangle+\text{H.c.}$	210	487	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^{\sigma}f_{+\lambda}{}^{\delta}u_{\delta}u_{\sigma}u_{\rho}\rangle+\text{H.c.}$		1560
$i\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}u_{\nu}f_{+\lambda}{}^{\rho}u_{\rho}\rangle+\text{H.c.}$	211	488	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^{\sigma}f_{+\sigma}{}^{\delta}u_{\lambda}u_{\rho}u_{\delta}\rangle+\text{H.c.}$	671	1561
$i\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}u_{\lambda}f_{+\nu}{}^{\rho}u_{\rho}\rangle+\text{H.c.}$	212	489	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^{\sigma}f_{+\sigma}{}^{\delta}u_{\lambda}u_{\delta}u_{\rho}\rangle+\text{H.c.}$		1562
$i\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}u^{\rho}f_{+\nu\lambda}u_{\rho}\rangle+\text{H.c.}$	213	490	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^{\sigma}f_{+\sigma}{}^{\delta}u_{\delta}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$		1563
$i\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}u^{\rho}f_{+\nu\rho}u_{\lambda}\rangle+\text{H.c.}$	214	491	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}\nabla_{\sigma}f_{+\nu\lambda}u_{\rho}u^{\delta}u_{\delta}\rangle+\text{H.c.}$		1564
$i\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}u^{\rho}f_{+\lambda\rho}u_{\nu}\rangle+\text{H.c.}$	215	492	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}\nabla_{\nu}f_{+\sigma}{}^{\delta}u_{\lambda}u_{\rho}u_{\delta}\rangle+\text{H.c.}$		1565
$i\langle W^{\mu\nu}f_{+}{}^{\lambda\rho}u_{\mu}f_{+\nu\lambda}u_{\rho}\rangle+\text{H.c.}$	216	493	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}\nabla_{\sigma}f_{+\nu\lambda}u^{\delta}u_{\delta}u_{\rho}\rangle+\text{H.c.}$		1566
$i\langle W^{\mu\nu}f_{+}{}^{\lambda\rho}u_{\mu}f_{+\lambda\rho}u_{\nu}\rangle+\text{H.c.}$	217	494	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}\nabla_{\nu}f_{+\sigma}{}^{\delta}u_{\lambda}u_{\delta}u_{\rho}\rangle+\text{H.c.}$		1567
$i\langle W^{\mu\nu}f_{+}{}^{\lambda\rho}u_{\lambda}f_{+\mu\nu}u_{\rho}\rangle+\text{H.c.}$	218	495	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}\nabla^{\delta}f_{+\nu\lambda}u_{\rho}u_{\sigma}u_{\delta}\rangle+\text{H.c.}$		1568
$i\langle W^{\mu\nu}f_{+}{}^{\lambda\rho}u_{\lambda}f_{+\mu\rho}u_{\nu}\rangle+\text{H.c.}$	219	496	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}\nabla_{\sigma}f_{+\nu}{}^{\delta}u_{\lambda}u_{\rho}u_{\delta}\rangle+\text{H.c.}$		1569
$i\langle W^{\mu\nu}f_{+\mu\nu}u^{\lambda}u^{\rho}f_{+\lambda\rho}\rangle+\text{H.c.}$	220	497	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}\nabla_{\sigma}f_{+\nu}{}^{\delta}u_{\delta}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$		1570
$i\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}u_{\nu}u^{\rho}f_{+\lambda\rho}\rangle+\text{H.c.}$	221	498	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}\nabla_{\nu}f_{+\sigma}{}^{\delta}u_{\delta}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$		1571
$i\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}u_{\lambda}u^{\rho}f_{+\nu\rho}\rangle$	222	499	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}\nabla^{\delta}f_{+\nu\sigma}u_{\lambda}u_{\rho}u_{\delta}\rangle+\text{H.c.}$		1572
$i\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}u^{\rho}u_{\nu}f_{+\lambda\rho}\rangle+\text{H.c.}$		500	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}\nabla^{\delta}f_{+\nu\lambda}u_{\delta}u_{\rho}u_{\sigma}\rangle+\text{H.c.}$		1573
$i\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}u^{\rho}u_{\lambda}f_{+\nu\rho}\rangle$		501	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}\nabla^{\delta}f_{+\sigma\delta}u_{\nu}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$		1574
$i\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}u^{\rho}u_{\rho}f_{+\nu\lambda}\rangle$		502	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}\nabla^{\delta}f_{+\nu\lambda}u_{\sigma}u_{\rho}u_{\delta}\rangle+\text{H.c.}$		1575
$i\langle W^{\mu\nu}u_{\mu}f_{+\nu}{}^{\lambda}f_{+\lambda}{}^{\rho}u_{\rho}\rangle+\text{H.c.}$	223	503	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}\nabla_{\sigma}f_{+\mu\nu}u_{\delta}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$		1576

Continued on next page

Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle W^{\mu\nu}u_\mu f_+{}^{\lambda\rho}f_{+\nu\lambda}u_\rho\rangle+\text{H.c.}$		504	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}\nabla_\mu f_{+\sigma\delta}u_\nu u_\lambda u_\rho\rangle+\text{H.c.}$		1577
$i\langle W^{\mu\nu}u_\mu f_+{}^{\lambda\rho}f_{+\lambda\rho}u_\nu\rangle$	224	505	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}\nabla_\sigma f_{+\mu\nu}u_\lambda u_\delta u_\rho\rangle+\text{H.c.}$		1578
$i\langle W^{\mu\nu}u^\lambda f_{+\mu\nu}f_{+\lambda}{}^\rho u_\rho\rangle+\text{H.c.}$	225	506	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\nabla_\rho f_+{}^{\sigma\delta}u_\sigma u_\delta\rangle+\text{H.c.}$		1579
$i\langle W^{\mu\nu}u^\lambda f_{+\mu\lambda}f_{+\nu}{}^\rho u_\rho\rangle$	226	507	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\nabla^\sigma f_{+\rho\sigma}u^\delta u_\delta\rangle+\text{H.c.}$		1580
$i\langle W^{\mu\nu}u^\lambda f_{+\mu}{}^\rho f_{+\nu\lambda}u_\rho\rangle$		508	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\nabla^\sigma f_{+\rho}{}^\delta u_\sigma u_\delta\rangle+\text{H.c.}$		1581
$i\langle W^{\mu\nu}u^\lambda f_{+\mu}{}^\rho f_{+\nu\rho}u_\lambda\rangle$		509	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\nabla^\sigma f_{+\rho}{}^\delta u_\delta u_\sigma\rangle+\text{H.c.}$		1582
$i\langle W^{\mu\nu}\rangle\langle f_{+\mu\nu}f_+{}^{\lambda\rho}u_\lambda u_\rho\rangle+\text{H.c.}$		510	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\nabla^\sigma f_{+\sigma}{}^\delta u_\rho u_\delta\rangle+\text{H.c.}$	672	1583
$i\langle W^{\mu\nu}f_{+\mu\nu}\rangle\langle f_+{}^{\lambda\rho}u_\lambda u_\rho\rangle$		511	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\nabla^\sigma f_{+\sigma}{}^\delta u_\delta u_\rho\rangle+\text{H.c.}$		1584
$i\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^\lambda f_{+\nu\lambda}u^\rho u_\rho\rangle$		512	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\nabla_\lambda f_{+\rho\sigma}u^\delta u_\delta\rangle+\text{H.c.}$		1585
$i\langle u^\mu u_\mu\rangle\langle W^{\nu\lambda}f_{+\nu}{}^\rho f_{+\lambda\rho}\rangle$		513	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\nabla_\lambda f_{+\rho}{}^\delta u_\sigma u_\delta\rangle+\text{H.c.}$		1586
$i\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^\lambda f_{+\nu}{}^\rho u_\lambda u_\rho\rangle$		514	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\nabla_\lambda f_{+\rho}{}^\delta u_\delta u_\sigma\rangle+\text{H.c.}$		1587
$i\langle W^{\mu\nu}f_{+\mu}{}^\lambda\rangle\langle f_{+\nu}{}^\rho u_\lambda u_\rho\rangle+\text{H.c.}$		515	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\nabla_\lambda f_{+\sigma}{}^\delta u_\rho u_\delta\rangle+\text{H.c.}$		1588
$i\langle u^\mu u^\nu\rangle\langle W^{\lambda\rho}f_{+\mu\lambda}f_{+\nu\rho}\rangle$		516	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\nabla_\sigma f_{+\lambda\rho}u^\delta u_\delta\rangle+\text{H.c.}$		1589
$i\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^\lambda f_{+\nu}{}^\rho u_\rho u_\lambda\rangle$		517	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\nabla_\lambda f_{+\sigma}{}^\delta u_\delta u_\rho\rangle+\text{H.c.}$		1590
$i\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^\lambda f_{+\lambda}{}^\rho u_\nu u_\rho\rangle+\text{H.c.}$		518	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\nabla^\delta f_{+\lambda\rho}u_\delta u_\sigma\rangle+\text{H.c.}$		1591
$i\langle W^{\mu\nu}f_{+\mu}{}^\lambda\rangle\langle f_{+\lambda}{}^\rho u_\nu u_\rho\rangle+\text{H.c.}$		519	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\nabla^\delta f_{+\lambda\sigma}u_\rho u_\delta\rangle+\text{H.c.}$	673	1592
$i\langle u^\mu u^\nu\rangle\langle W_\mu{}^\lambda f_{+\lambda}{}^\rho f_{+\nu\rho}\rangle+\text{H.c.}$		520	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\nabla_\sigma f_{+\lambda}{}^\delta u_\rho u_\delta\rangle+\text{H.c.}$		1593
$i\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^\lambda f_{+\lambda}{}^\rho u_\rho u_\nu\rangle+\text{H.c.}$		521	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\nabla^\delta f_{+\lambda\rho}u_\sigma u_\delta\rangle+\text{H.c.}$		1594
$i\langle W^{\mu\nu}f_+{}^{\lambda\rho}\rangle\langle f_{+\mu\nu}u_\lambda u_\rho\rangle$		522	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\nabla_\sigma f_{+\lambda}{}^\delta u_\delta u_\rho\rangle+\text{H.c.}$		1595
$i\langle W^{\mu\nu}f_+{}^{\lambda\rho}\rangle\langle f_{+\mu\lambda}u_\nu u_\rho\rangle+\text{H.c.}$		523	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\nabla^\delta f_{+\lambda\sigma}u_\delta u_\rho\rangle+\text{H.c.}$		1596
$i\langle W^{\mu\nu}\rangle\langle f_+{}^{\lambda\rho}f_{+\lambda\rho}u_\mu u_\nu\rangle$		524	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\nabla^\delta f_{+\lambda\delta}u_\rho u_\sigma\rangle+\text{H.c.}$	674	1597
$i\langle W^{\mu\nu}f_+{}^{\lambda\rho}\rangle\langle f_{+\lambda\rho}u_\mu u_\nu\rangle$		525	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\nabla^\delta f_{+\lambda\delta}u_\sigma u_\rho\rangle+\text{H.c.}$		1598
$i\langle W^{\mu\nu}\rangle\langle f_{+\mu\nu}u^\lambda f_{+\lambda}{}^\rho u_\rho\rangle$		526	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\nabla^\delta f_{+\sigma\delta}u_\lambda u_\rho\rangle+\text{H.c.}$		1599
$i\langle f_+{}^{\mu\nu}u_\mu\rangle\langle W^{\lambda\rho}f_{+\lambda\rho}u_\nu\rangle+\text{H.c.}$		527	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma\nabla_\nu f_{+\lambda}{}^\delta u_\rho u_\delta\rangle+\text{H.c.}$		1600
$i\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^\lambda u_\nu f_{+\lambda}{}^\rho u_\rho\rangle+\text{H.c.}$		528	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma\nabla_\nu f_{+\lambda}{}^\delta u_\delta u_\rho\rangle+\text{H.c.}$		1601
$i\langle W^{\mu\nu}\nabla_\mu f_{+\nu}{}^\lambda\nabla^\rho f_{+\lambda\rho}\rangle+\text{H.c.}$	227	529	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma\nabla^\delta f_{+\nu\lambda}u_\rho u_\delta\rangle+\text{H.c.}$		1602
$i\langle W^{\mu\nu}\nabla_\mu f_+{}^{\lambda\rho}\nabla_\nu f_{+\lambda\rho}\rangle$	228	530	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma\nabla^\delta f_{+\nu\lambda}u_\delta u_\rho\rangle+\text{H.c.}$		1603
$i\langle W^{\mu\nu}\nabla^\lambda f_{+\mu\lambda}\nabla^\rho f_{+\nu\rho}\rangle$	229	531	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma\nabla^\delta f_{+\nu\delta}u_\lambda u_\rho\rangle+\text{H.c.}$		1604
$i\langle W^{\mu\nu}f_{+\mu}{}^\lambda\nabla_\lambda\nabla^\rho f_{+\nu\rho}\rangle+\text{H.c.}$	230	532	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu\nabla_\sigma f_{+\lambda\rho}u^\delta u_\delta\rangle+\text{H.c.}$		1605
$\langle W^{\mu\nu}f_{+\mu\nu}f_+{}^{\lambda\rho}f_{+\lambda\rho}\rangle+\text{H.c.}$	231	533	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu\nabla_\lambda f_{+\sigma}{}^\delta u_\rho u_\delta\rangle+\text{H.c.}$		1606
$\langle W^{\mu\nu}f_{+\mu}{}^\lambda f_{+\nu}{}^\rho f_{+\lambda\rho}\rangle+\text{H.c.}$	232	534	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu\nabla_\sigma f_{+\lambda}{}^\delta u_\rho u_\delta\rangle+\text{H.c.}$		1607
$\langle W^{\mu\nu}f_{+\mu}{}^\lambda f_{+\lambda}{}^\rho f_{+\nu\rho}\rangle$	233	535	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu\nabla^\delta f_{+\lambda\rho}u_\sigma u_\delta\rangle+\text{H.c.}$		1608
$\langle W^{\mu\nu}f_+{}^{\lambda\rho}f_{+\mu\nu}f_{+\lambda\rho}\rangle$	234	536	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu\nabla_\lambda f_{+\sigma}{}^\delta u_\delta u_\rho\rangle+\text{H.c.}$		1609
$\langle W^{\mu\nu}\rangle\langle f_{+\mu\nu}f_+{}^{\lambda\rho}f_{+\lambda\rho}\rangle$	235	537	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu\nabla^\delta f_{+\lambda\rho}u_\delta u_\sigma\rangle+\text{H.c.}$		1610
$\langle W^{\mu\nu}f_{+\mu\nu}\rangle\langle f_+{}^{\lambda\rho}f_{+\lambda\rho}\rangle$	236	538	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu\nabla^\delta f_{+\lambda\delta}u_\rho u_\sigma\rangle+\text{H.c.}$		1611
$\langle f_+{}^{\mu\nu}\rangle\langle W^{\lambda\rho}f_{+\lambda\rho}f_{+\mu\nu}\rangle+\text{H.c.}$	237		$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu\nabla^\delta f_{+\sigma\delta}u_\lambda u_\rho\rangle+\text{H.c.}$		1612

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^{\lambda}f_{+\nu}{}^{\rho}f_{+\lambda\rho}\rangle$	238	539	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u^{\delta}\nabla_{\sigma}f_{+\nu\lambda}u_{\rho}u_{\delta}\rangle+\text{H.c.}$		1613
$\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}\rangle\langle f_{+\nu}{}^{\rho}f_{+\lambda\rho}\rangle$	239	540	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u^{\delta}\nabla_{\sigma}f_{+\nu\lambda}u_{\delta}u_{\rho}\rangle+\text{H.c.}$		1614
$\langle f_{+}{}^{\mu\nu}\rangle\langle W^{\lambda\rho}f_{+\mu\lambda}f_{+\nu\rho}\rangle$	240		$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u^{\delta}\nabla_{\nu}f_{+\sigma\delta}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$		1615
$\langle f_{+}{}^{\mu\nu}\rangle\langle W_{\mu}{}^{\lambda}f_{+\lambda}{}^{\rho}f_{+\nu\rho}\rangle+\text{H.c.}$	241		$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u^{\delta}\nabla_{\delta}f_{+\nu\lambda}u_{\sigma}u_{\rho}\rangle+\text{H.c.}$		1616
$\langle W^{\mu\nu}f_{+}{}^{\lambda\rho}\rangle\langle f_{+\mu\nu}f_{+\lambda\rho}\rangle$	242		$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u^{\delta}\nabla_{\delta}f_{+\nu\lambda}u_{\rho}u_{\sigma}\rangle+\text{H.c.}$		1617
$\langle W^{\mu\nu}f_{+}{}^{\lambda\rho}\rangle\langle f_{+\mu\lambda}f_{+\nu\rho}\rangle$	243		$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_{\sigma}\nabla_{\delta}f_{+\mu\nu}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$		1618
$\langle f_{+}{}^{\mu\nu}\rangle\langle W_{\mu\nu}f_{+}{}^{\lambda\rho}f_{+\lambda\rho}\rangle$	244		$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_{\mu}\nabla_{\sigma}f_{+\nu\lambda}u_{\delta}u_{\rho}\rangle+\text{H.c.}$		1619
$i\langle W^{\mu\nu}u_{\mu}u_{\nu}u^{\lambda}u_{\lambda}\chi_{+}\rangle+\text{H.c.}$	245	541	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_{\mu}\nabla_{\nu}f_{+\sigma\delta}u_{\lambda}u_{\rho}\rangle+\text{H.c.}$		1620
$i\langle W^{\mu\nu}u_{\mu}u^{\lambda}u_{\nu}u_{\lambda}\chi_{+}\rangle+\text{H.c.}$	246	542	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_{\mu}\nabla_{\sigma}f_{+\nu\lambda}u_{\rho}u_{\delta}\rangle+\text{H.c.}$		1621
$i\langle W^{\mu\nu}u_{\mu}u^{\lambda}u_{\lambda}u_{\nu}\chi_{+}\rangle+\text{H.c.}$		543	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda\rho}u^{\sigma}u^{\delta}f_{-\sigma\delta}\rangle+\text{H.c.}$		1622
$i\langle W^{\mu\nu}u^{\lambda}u_{\mu}u_{\nu}u_{\lambda}\chi_{+}\rangle+\text{H.c.}$		544	$\varepsilon^{\mu\nu\lambda\rho}\langle u^{\sigma}f_{-\sigma}{}^{\delta}\rangle\langle W_{\mu\nu}f_{+\lambda\rho}u_{\delta}\rangle+\text{H.c.}$	675	1623
$i\langle W^{\mu\nu}u^{\lambda}u_{\mu}u_{\lambda}u_{\nu}\chi_{+}\rangle+\text{H.c.}$		545	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^{\sigma}u_{\rho}u^{\delta}f_{-\sigma\delta}\rangle+\text{H.c.}$	676	1624
$i\langle W^{\mu\nu}u^{\lambda}u_{\lambda}u_{\mu}u_{\nu}\chi_{+}\rangle+\text{H.c.}$		546	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}\rangle\langle u_{\rho}u^{\delta}f_{-\sigma\delta}\rangle+\text{H.c.}$		1625
$i\langle W^{\mu\nu}u_{\mu}u_{\nu}u^{\lambda}\chi_{+}u_{\lambda}\rangle+\text{H.c.}$	247	547	$\varepsilon^{\mu\nu\lambda\rho}\langle u^{\sigma}f_{-\sigma}{}^{\delta}\rangle\langle W_{\mu\nu}f_{+\lambda\delta}u_{\rho}\rangle+\text{H.c.}$	677	1626
$i\langle W^{\mu\nu}u_{\mu}u^{\lambda}u_{\nu}\chi_{+}u_{\lambda}\rangle+\text{H.c.}$		548	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^{\sigma}u_{\sigma}u^{\delta}f_{-\rho\delta}\rangle+\text{H.c.}$	678	1627
$i\langle W^{\mu\nu}u_{\mu}u^{\lambda}u_{\lambda}\chi_{+}u_{\nu}\rangle+\text{H.c.}$	248	549	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^{\sigma}u^{\delta}u_{\rho}f_{-\sigma\delta}\rangle+\text{H.c.}$		1628
$i\langle W^{\mu\nu}u^{\lambda}u_{\mu}u_{\nu}\chi_{+}u_{\lambda}\rangle+\text{H.c.}$		550	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}\rangle\langle u_{\sigma}u^{\delta}f_{-\rho\delta}\rangle+\text{H.c.}$		1629
$i\langle W^{\mu\nu}u^{\lambda}u_{\mu}u_{\lambda}\chi_{+}u_{\nu}\rangle+\text{H.c.}$		551	$\varepsilon^{\mu\nu\lambda\rho}\langle u^{\sigma}f_{-\mu\sigma}\rangle\langle W_{\nu\lambda}f_{+\rho}{}^{\delta}u_{\delta}\rangle+\text{H.c.}$	679	1630
$i\langle W^{\mu\nu}u^{\lambda}u_{\lambda}u_{\mu}\chi_{+}u_{\nu}\rangle+\text{H.c.}$		552	$\varepsilon^{\mu\nu\lambda\rho}\langle u_{\mu}f_{-}{}^{\sigma\delta}\rangle\langle W_{\nu\lambda}f_{+\rho\sigma}u_{\delta}\rangle+\text{H.c.}$	680	1631
$i\langle W^{\mu\nu}u_{\mu}u_{\nu}\chi_{+}u^{\lambda}u_{\lambda}\rangle+\text{H.c.}$		553	$\varepsilon^{\mu\nu\lambda\rho}\langle u^{\sigma}f_{-\mu\nu}\rangle\langle W_{\sigma}{}^{\delta}f_{+\lambda\delta}u_{\rho}\rangle+\text{H.c.}$		1632
$i\langle W^{\mu\nu}u_{\mu}u^{\lambda}\chi_{+}u_{\nu}u_{\lambda}\rangle+\text{H.c.}$		554	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^{\sigma}u^{\delta}u_{\sigma}f_{-\rho\delta}\rangle+\text{H.c.}$		1633
$i\langle W^{\mu\nu}u_{\mu}u^{\lambda}\chi_{+}u_{\lambda}u_{\nu}\rangle$		555	$\varepsilon^{\mu\nu\lambda\rho}\langle u^{\sigma}f_{-\mu}{}^{\delta}\rangle\langle W_{\nu\lambda}f_{+\rho\sigma}u_{\delta}\rangle+\text{H.c.}$	681	1634
$i\langle W^{\mu\nu}u^{\lambda}u_{\mu}\chi_{+}u_{\nu}u_{\lambda}\rangle$		556	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^{\sigma}u^{\delta}u_{\delta}f_{-\rho\sigma}\rangle+\text{H.c.}$	682	1635
$i\langle W^{\mu\nu}\rangle\langle u_{\mu}u_{\nu}u^{\lambda}u_{\lambda}\chi_{+}\rangle+\text{H.c.}$		557	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}\rangle\langle u^{\delta}u_{\delta}f_{-\rho\sigma}\rangle$		1636
$i\langle W^{\mu\nu}u_{\mu}\rangle\langle u_{\nu}u^{\lambda}u_{\lambda}\chi_{+}\rangle+\text{H.c.}$		558	$\varepsilon^{\mu\nu\lambda\rho}\langle u^{\sigma}f_{-\mu}{}^{\delta}\rangle\langle W_{\nu\lambda}f_{+\rho\delta}u_{\sigma}\rangle+\text{H.c.}$	683	1637
$i\langle W^{\mu\nu}u_{\mu}u_{\nu}\rangle\langle u^{\lambda}u_{\lambda}\chi_{+}\rangle$		559	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+}{}^{\sigma\delta}u_{\lambda}u_{\rho}f_{-\sigma\delta}\rangle+\text{H.c.}$		1638
$i\langle u^{\mu}\chi_{+}\rangle\langle W^{\nu\lambda}u_{\nu}u_{\lambda}u_{\mu}\rangle+\text{H.c.}$		560	$\varepsilon^{\mu\nu\lambda\rho}\langle u_{\mu}f_{-}{}^{\sigma\delta}\rangle\langle W_{\nu\lambda}f_{+\sigma\delta}u_{\rho}\rangle+\text{H.c.}$		1639
$i\langle\chi_{+}\rangle\langle W^{\mu\nu}u_{\mu}u_{\nu}u^{\lambda}u_{\lambda}\rangle+\text{H.c.}$		561	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+}{}^{\sigma\delta}u_{\lambda}u_{\sigma}f_{-\rho\delta}\rangle+\text{H.c.}$	684	1640
$i\langle W^{\mu\nu}\rangle\langle u_{\mu}u^{\lambda}u_{\nu}u_{\lambda}\chi_{+}\rangle+\text{H.c.}$		562	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+}{}^{\sigma\delta}\rangle\langle u_{\lambda}u_{\sigma}f_{-\rho\delta}\rangle+\text{H.c.}$		1641
$i\langle W^{\mu\nu}u_{\mu}u^{\lambda}\rangle\langle u_{\nu}u_{\lambda}\chi_{+}\rangle+\text{H.c.}$		563	$\varepsilon^{\mu\nu\lambda\rho}\langle u^{\sigma}f_{-\mu}{}^{\delta}\rangle\langle W_{\nu\lambda}f_{+\sigma\delta}u_{\rho}\rangle+\text{H.c.}$	685	1642
$i\langle u^{\mu}\chi_{+}\rangle\langle W^{\nu\lambda}u_{\nu}u_{\mu}u_{\lambda}\rangle$		564	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+}{}^{\sigma\delta}u_{\sigma}u_{\lambda}f_{-\rho\delta}\rangle+\text{H.c.}$	686	1643
$i\langle\chi_{+}\rangle\langle W^{\mu\nu}u_{\mu}u^{\lambda}u_{\nu}u_{\lambda}\rangle+\text{H.c.}$		565	$\varepsilon^{\mu\nu\lambda\rho}\langle u_{\mu}f_{-\nu}{}^{\sigma}\rangle\langle W_{\lambda\rho}f_{+\sigma}{}^{\delta}u_{\delta}\rangle+\text{H.c.}$	687	1644
$i\langle W^{\mu\nu}\rangle\langle u_{\mu}u^{\lambda}u_{\lambda}u_{\nu}\chi_{+}\rangle$		566	$\varepsilon^{\mu\nu\lambda\rho}\langle u^{\sigma}f_{-\mu}{}^{\delta}\rangle\langle W_{\nu\delta}f_{+\lambda\sigma}u_{\rho}\rangle+\text{H.c.}$	688	
$i\langle W^{\mu\nu}u_{\mu}u^{\lambda}\rangle\langle u_{\lambda}u_{\nu}\chi_{+}\rangle+\text{H.c.}$		567	$\varepsilon^{\mu\nu\lambda\rho}\langle u^{\sigma}f_{-\mu\nu}\rangle\langle W_{\lambda}{}^{\delta}f_{+\rho\delta}u_{\sigma}\rangle+\text{H.c.}$	689	
$i\langle u^{\mu}\chi_{+}\rangle\langle W_{\mu}{}^{\nu}u_{\nu}u^{\lambda}u_{\lambda}\rangle+\text{H.c.}$		568	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}\rangle\langle f_{+\sigma}{}^{\delta}u_{\nu}u_{\delta}f_{-\lambda\rho}\rangle+\text{H.c.}$	690	
$i\langle W^{\mu\nu}\rangle\langle u^{\lambda}u_{\mu}u_{\nu}u_{\lambda}\chi_{+}\rangle$		569	$\varepsilon^{\mu\nu\lambda\rho}\langle u^{\sigma}f_{-\mu\nu}\rangle\langle W_{\lambda}{}^{\delta}f_{+\sigma\delta}u_{\rho}\rangle+\text{H.c.}$	691	
$i\langle W^{\mu\nu}u^{\lambda}\chi_{+}\rangle\langle u_{\mu}u_{\nu}u_{\lambda}\rangle+\text{H.c.}$		570	$\varepsilon^{\mu\nu\lambda\rho}\langle u_{\mu}f_{-\nu\lambda}\rangle\langle W_{\rho}{}^{\sigma}f_{+\sigma}{}^{\delta}u_{\delta}\rangle+\text{H.c.}$	692	

Continued on next page

Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle W^{\mu\nu}f_{-\mu}{}^{\lambda}f_{-\nu\lambda}\chi_+\rangle+\text{H.c.}$	249	571	$\varepsilon^{\mu\nu\lambda\rho}\langle u^{\sigma}f_{-\mu}{}^{\delta}\rangle\langle W_{\nu\delta}f_{+\lambda\rho}u_{\sigma}\rangle+\text{H.c.}$	693	
$i\langle W^{\mu\nu}f_{-\mu}{}^{\lambda}\chi_+f_{-\nu\lambda}\rangle$	250	572	$\varepsilon^{\mu\nu\lambda\rho}\langle u_{\mu}f_{-\nu}{}^{\sigma}\rangle\langle W_{\lambda\sigma}f_{+\rho}{}^{\delta}u_{\delta}\rangle+\text{H.c.}$	694	
$i\langle W^{\mu\nu}f_{-\mu}{}^{\lambda}h_{\nu\lambda}\chi_+\rangle+\text{H.c.}$	251	573	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}\rangle\langle f_{+\sigma\delta}u_{\mu}u_{\nu}f_{-\lambda\rho}\rangle+\text{H.c.}$	695	
$i\langle W^{\mu\nu}f_{-\mu}{}^{\lambda}\chi_+h_{\nu\lambda}\rangle+\text{H.c.}$	252	574	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+}{}^{\sigma\delta}u_{\sigma}u_{\delta}f_{-\lambda\rho}\rangle+\text{H.c.}$		1645
$i\langle W^{\mu\nu}h_{\mu}{}^{\lambda}f_{-\nu\lambda}\chi_+\rangle+\text{H.c.}$		575	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^{\sigma}u_{\rho}f_{-\sigma}{}^{\delta}u_{\delta}\rangle+\text{H.c.}$		1646
$i\langle W^{\mu\nu}h_{\mu}{}^{\lambda}h_{\nu\lambda}\chi_+\rangle+\text{H.c.}$	253	576	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^{\sigma}u_{\sigma}f_{-\rho}{}^{\delta}u_{\delta}\rangle+\text{H.c.}$		1647
$i\langle W^{\mu\nu}h_{\mu}{}^{\lambda}\chi_+h_{\nu\lambda}\rangle$	254	577	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^{\sigma}u^{\delta}f_{-\rho\sigma}u_{\delta}\rangle$		1648
$i\langle W^{\mu\nu}u_{\mu}\nabla^{\lambda}f_{-\nu\lambda}\chi_+\rangle+\text{H.c.}$	255	578	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+}{}^{\sigma\delta}u_{\lambda}f_{-\rho\sigma}u_{\delta}\rangle+\text{H.c.}$		1649
$i\langle W^{\mu\nu}u^{\lambda}\nabla_{\mu}f_{-\nu\lambda}\chi_+\rangle+\text{H.c.}$	256	579	$\varepsilon^{\mu\nu\lambda\rho}\langle u^{\sigma}u_{\sigma}\rangle\langle W_{\mu\nu}f_{+\lambda}{}^{\delta}f_{-\rho\delta}\rangle+\text{H.c.}$	696	1650
$i\langle W^{\mu\nu}u_{\mu}\chi_+\nabla^{\lambda}f_{-\nu\lambda}\rangle+\text{H.c.}$	257	580	$\varepsilon^{\mu\nu\lambda\rho}\langle u_{\mu}u^{\sigma}\rangle\langle W_{\nu\lambda}f_{+\sigma}{}^{\delta}f_{-\rho\delta}\rangle+\text{H.c.}$	697	
$i\langle W^{\mu\nu}u^{\lambda}\chi_+\nabla_{\mu}f_{-\nu\lambda}\rangle+\text{H.c.}$	258	581	$\varepsilon^{\mu\nu\lambda\rho}\langle u^{\sigma}u_{\sigma}\rangle\langle W_{\mu}{}^{\delta}f_{+\nu\delta}f_{-\lambda\rho}\rangle+\text{H.c.}$	698	
$i\langle W^{\mu\nu}\nabla_{\mu}f_{-\nu}{}^{\lambda}u_{\lambda}\chi_+\rangle+\text{H.c.}$		582	$\varepsilon^{\mu\nu\lambda\rho}\langle u^{\sigma}u^{\delta}\rangle\langle W_{\mu\nu}f_{+\lambda\sigma}f_{-\rho\delta}\rangle+\text{H.c.}$		1651
$i\langle W^{\mu\nu}\nabla^{\lambda}f_{-\mu\lambda}u_{\nu}\chi_+\rangle+\text{H.c.}$		583	$\varepsilon^{\mu\nu\lambda\rho}\langle u_{\mu}u^{\sigma}\rangle\langle W_{\nu}{}^{\delta}f_{+\sigma\delta}f_{-\lambda\rho}\rangle+\text{H.c.}$	699	1652
$i\langle W^{\mu\nu}u_{\mu}f_{-\nu}{}^{\lambda}\nabla_{\lambda}\chi_+\rangle+\text{H.c.}$	259	584	$\varepsilon^{\mu\nu\lambda\rho}\langle u^{\sigma}u_{\sigma}\rangle\langle W_{\mu}{}^{\delta}f_{+\nu\lambda}f_{-\rho\delta}\rangle+\text{H.c.}$	700	
$i\langle W^{\mu\nu}u^{\lambda}f_{-\mu\lambda}\nabla_{\nu}\chi_+\rangle+\text{H.c.}$	260	585	$\varepsilon^{\mu\nu\lambda\rho}\langle u_{\mu}u^{\sigma}\rangle\langle W_{\nu}{}^{\delta}f_{+\lambda\sigma}f_{-\rho\delta}\rangle+\text{H.c.}$	701	
$i\langle W^{\mu\nu}u_{\mu}\nabla^{\lambda}\chi_+f_{-\nu\lambda}\rangle+\text{H.c.}$	261	586	$\varepsilon^{\mu\nu\lambda\rho}\langle u_{\mu}u^{\sigma}\rangle\langle W_{\sigma}{}^{\delta}f_{+\nu\delta}f_{-\lambda\rho}\rangle+\text{H.c.}$		1653
$i\langle W^{\mu\nu}u^{\lambda}\nabla_{\mu}\chi_+f_{-\nu\lambda}\rangle+\text{H.c.}$	262	587	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_{\lambda}\rangle\langle f_{+\rho}{}^{\sigma}u^{\delta}f_{-\sigma\delta}\rangle+\text{H.c.}$	702	1654
$i\langle W^{\mu\nu}f_{-\mu\nu}u^{\lambda}\nabla_{\lambda}\chi_+\rangle+\text{H.c.}$		588	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_{\lambda}\rangle\langle f_{+}{}^{\sigma\delta}u_{\rho}f_{-\sigma\delta}\rangle+\text{H.c.}$		1655
$i\langle W^{\mu\nu}f_{-\mu}{}^{\lambda}u_{\lambda}\nabla_{\nu}\chi_+\rangle+\text{H.c.}$		589	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_{\lambda}\rangle\langle f_{+}{}^{\sigma\delta}u_{\sigma}f_{-\rho\delta}\rangle+\text{H.c.}$		1656
$i\langle W^{\mu\nu}u_{\mu}h_{\nu}{}^{\lambda}\nabla_{\lambda}\chi_+\rangle+\text{H.c.}$	263	590	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^{\sigma}\rangle\langle f_{+\lambda\rho}u^{\delta}f_{-\sigma\delta}\rangle+\text{H.c.}$	703	1657
$i\langle W^{\mu\nu}u^{\lambda}h_{\mu\lambda}\nabla_{\nu}\chi_+\rangle+\text{H.c.}$	264	591	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^{\sigma}\rangle\langle f_{+\lambda\sigma}u^{\delta}f_{-\rho\delta}\rangle+\text{H.c.}$	704	1658
$i\langle W^{\mu\nu}u_{\mu}\nabla^{\lambda}\chi_+h_{\nu\lambda}\rangle+\text{H.c.}$	265	592	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^{\sigma}\rangle\langle f_{+\lambda}{}^{\delta}u_{\rho}f_{-\sigma\delta}\rangle+\text{H.c.}$	705	1659
$i\langle W^{\mu\nu}u^{\lambda}\nabla_{\mu}\chi_+h_{\nu\lambda}\rangle+\text{H.c.}$	266	593	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^{\sigma}\rangle\langle f_{+\lambda}{}^{\delta}u_{\sigma}f_{-\rho\delta}\rangle+\text{H.c.}$	706	1660
$i\langle W^{\mu\nu}h_{\mu}{}^{\lambda}u_{\nu}\nabla_{\lambda}\chi_+\rangle+\text{H.c.}$		594	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^{\sigma}\rangle\langle f_{+\lambda}{}^{\delta}u_{\delta}f_{-\rho\sigma}\rangle+\text{H.c.}$	707	1661
$i\langle W^{\mu\nu}h_{\mu}{}^{\lambda}u_{\lambda}\nabla_{\nu}\chi_+\rangle+\text{H.c.}$		595	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}u^{\delta}\rangle\langle f_{+\nu\lambda}u_{\delta}f_{-\rho\sigma}\rangle+\text{H.c.}$	708	
$i\langle W^{\mu\nu}u_{\mu}u^{\lambda}\nabla_{\nu}\nabla_{\lambda}\chi_+\rangle+\text{H.c.}$		596	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^{\sigma}\rangle\langle f_{+\sigma}{}^{\delta}u_{\lambda}f_{-\rho\delta}\rangle+\text{H.c.}$		1662
$i\langle W^{\mu\nu}\rangle\langle f_{-\mu}{}^{\lambda}f_{-\nu\lambda}\chi_+\rangle$		597	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^{\sigma}\rangle\langle f_{+\sigma}{}^{\delta}u_{\delta}f_{-\lambda\rho}\rangle+\text{H.c.}$		1663
$i\langle\chi_+\rangle\langle W^{\mu\nu}f_{-\mu}{}^{\lambda}f_{-\nu\lambda}\rangle$		598	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^{\sigma}f_{-\sigma}{}^{\delta}\rangle\langle W_{\nu\lambda}u_{\rho}u_{\delta}\rangle+\text{H.c.}$		1664
$i\langle W^{\mu\nu}\rangle\langle f_{-\mu}{}^{\lambda}h_{\nu\lambda}\chi_+\rangle+\text{H.c.}$		599	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+}{}^{\sigma\delta}f_{-\mu\sigma}\rangle\langle W_{\nu\lambda}u_{\rho}u_{\delta}\rangle+\text{H.c.}$		1665
$i\langle\chi_+\rangle\langle W^{\mu\nu}f_{-\mu}{}^{\lambda}h_{\nu\lambda}\rangle+\text{H.c.}$		600	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^{\sigma}f_{-\nu\sigma}\rangle\langle W_{\lambda\rho}u^{\delta}u_{\delta}\rangle$		1666
$i\langle W^{\mu\nu}\rangle\langle h_{\mu}{}^{\lambda}h_{\nu\lambda}\chi_+\rangle$		601	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^{\sigma}f_{-\nu}{}^{\delta}\rangle\langle W_{\lambda\rho}u_{\sigma}u_{\delta}\rangle+\text{H.c.}$		1667
$i\langle\chi_+\rangle\langle W^{\mu\nu}h_{\mu}{}^{\lambda}h_{\nu\lambda}\rangle$		602	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+}{}^{\sigma\delta}u_{\sigma}\rangle\langle W_{\mu\nu}u_{\lambda}f_{-\rho\delta}\rangle+\text{H.c.}$	709	1668
$i\langle W^{\mu\nu}\rangle\langle u_{\mu}\nabla^{\lambda}f_{-\nu\lambda}\chi_+\rangle+\text{H.c.}$		603	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+}{}^{\sigma\delta}\rangle\langle W_{\mu\nu}u_{\lambda}f_{-\rho\sigma}u_{\delta}\rangle+\text{H.c.}$	710	
$i\langle\chi_+\rangle\langle W^{\mu\nu}u_{\mu}\nabla^{\lambda}f_{-\nu\lambda}\rangle+\text{H.c.}$		604	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^{\sigma}\rangle\langle W_{\nu\lambda}u_{\rho}f_{-\sigma}{}^{\delta}u_{\delta}\rangle+\text{H.c.}$	711	
$i\langle W^{\mu\nu}\rangle\langle u^{\lambda}\nabla_{\mu}f_{-\nu\lambda}\chi_+\rangle+\text{H.c.}$		605	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu}\rangle\langle W^{\sigma\delta}u_{\sigma}f_{-\lambda\delta}u_{\rho}\rangle+\text{H.c.}$	712	
$i\langle\chi_+\rangle\langle W^{\mu\nu}u^{\lambda}\nabla_{\mu}f_{-\nu\lambda}\rangle+\text{H.c.}$		606	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^{\sigma}u^{\delta}\rangle\langle W_{\nu\lambda}u_{\rho}f_{-\sigma\delta}\rangle+\text{H.c.}$		1669

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle W^{\mu\nu}\rangle\langle u_\mu f_{-\nu}{}^{\lambda}\nabla_\lambda\chi_+\rangle+\text{H.c.}$		607	$\varepsilon^{\mu\nu\lambda\rho}\langle f_+{}^{\sigma\delta}u_\mu\rangle\langle W_{\nu\lambda}u_\rho f_{-\sigma\delta}\rangle+\text{H.c.}$		1670
$i\langle\nabla^\mu\chi_+\rangle\langle W^{\nu\lambda}u_\nu f_{-\mu\lambda}\rangle+\text{H.c.}$		608	$\varepsilon^{\mu\nu\lambda\rho}\langle f_+{}^{\sigma\delta}u_\sigma\rangle\langle W_{\mu\nu}u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$		1671
$i\langle W^{\mu\nu}\rangle\langle u^\lambda f_{-\mu\lambda}\nabla_\nu\chi_+\rangle+\text{H.c.}$		609	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^{\sigma}u^\delta\rangle\langle W_{\nu\lambda}u_\sigma f_{-\rho\delta}\rangle+\text{H.c.}$		1672
$i\langle\nabla^\mu\chi_+\rangle\langle W_\mu{}^\nu u^\lambda f_{-\nu\lambda}\rangle+\text{H.c.}$		610	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^{\sigma}u^\delta\rangle\langle W_{\nu\lambda}u_\delta f_{-\rho\sigma}\rangle+\text{H.c.}$		1673
$i\langle W^{\mu\nu}\rangle\langle u_\mu h_\nu{}^\lambda\nabla_\lambda\chi_+\rangle+\text{H.c.}$		611	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu}u^\sigma\rangle\langle W_{\lambda\rho}u^\delta f_{-\sigma\delta}\rangle+\text{H.c.}$		1674
$i\langle\nabla^\mu\chi_+\rangle\langle W^{\nu\lambda}u_\nu h_{\mu\lambda}\rangle+\text{H.c.}$		612	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^{\sigma}u_\nu\rangle\langle W_{\lambda\rho}u^\delta f_{-\sigma\delta}\rangle+\text{H.c.}$		1675
$i\langle W^{\mu\nu}\rangle\langle u^\lambda h_{\mu\lambda}\nabla_\nu\chi_+\rangle+\text{H.c.}$		613	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu}u^\sigma\rangle\langle W_\lambda{}^\delta u_\delta f_{-\rho\sigma}\rangle+\text{H.c.}$		1676
$i\langle\nabla^\mu\chi_+\rangle\langle W_\mu{}^\nu u^\lambda h_{\nu\lambda}\rangle+\text{H.c.}$		614	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu}u^\sigma\rangle\langle W_\lambda{}^\delta u_\sigma f_{-\rho\delta}\rangle+\text{H.c.}$		1677
$\langle W^{\mu\nu}f_{+\mu\nu}u^\lambda u_\lambda\chi_+\rangle+\text{H.c.}$	267	615	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^{\sigma}u^\delta\rangle\langle W_{\nu\delta}u_\sigma f_{-\lambda\rho}\rangle+\text{H.c.}$		1678
$\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}u_\nu u_\lambda\chi_+\rangle+\text{H.c.}$	268	616	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu}u_\lambda\rangle\langle W^{\sigma\delta}u_\sigma f_{-\rho\delta}\rangle+\text{H.c.}$		1679
$\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}u_\lambda u_\nu\chi_+\rangle+\text{H.c.}$	269	617	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^{\sigma}u_\nu\rangle\langle W_\sigma{}^\delta u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$		1680
$\langle W^{\mu\nu}f_{+\mu\nu}u^\lambda\chi_+u_\lambda\rangle+\text{H.c.}$	270	618	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu}u_\lambda\rangle\langle W^{\sigma\delta}u_\rho f_{-\sigma\delta}\rangle+\text{H.c.}$		1681
$\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}u_\nu\chi_+u_\lambda\rangle+\text{H.c.}$	271	619	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu}u^\sigma\rangle\langle W_\sigma{}^\delta u_\lambda f_{-\rho\delta}\rangle+\text{H.c.}$		1682
$\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}u_\lambda\chi_+u_\nu\rangle+\text{H.c.}$	272	620	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^{\sigma}u^\delta\rangle\langle W_{\sigma\delta}u_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$		1683
$\langle W^{\mu\nu}f_{+\mu\nu}\chi_+u^\lambda u_\lambda\rangle+\text{H.c.}$		621	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{-\lambda}{}^{\sigma}\rangle\langle f_{+\rho}{}^{\delta}u_\sigma u_\delta\rangle+\text{H.c.}$		1684
$\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}\chi_+u_\nu u_\lambda\rangle+\text{H.c.}$		622	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}f_{-\mu\sigma}\rangle\langle f_{+\nu\lambda}u_\delta u_\rho\rangle+\text{H.c.}$		1685
$\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}\chi_+u_\lambda u_\nu\rangle+\text{H.c.}$		623	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda\rho}u^\sigma u^\delta h_{\sigma\delta}\rangle+\text{H.c.}$	713	1686
$\langle W^{\mu\nu}u_\mu f_{+\nu}{}^{\lambda}u_\lambda\chi_+\rangle+\text{H.c.}$	273	624	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda\rho}\rangle\langle u^\sigma u^\delta h_{\sigma\delta}\rangle$		1687
$\langle W^{\mu\nu}u^\lambda f_{+\mu\nu}u_\lambda\chi_+\rangle+\text{H.c.}$	274	625	$\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma h_\sigma{}^\delta\rangle\langle W_{\mu\nu}f_{+\lambda\rho}u_\delta\rangle+\text{H.c.}$	714	1688
$\langle W^{\mu\nu}u^\lambda f_{+\mu\lambda}u_\nu\chi_+\rangle+\text{H.c.}$	275	626	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^{\sigma}u_\rho u^\delta h_{\sigma\delta}\rangle+\text{H.c.}$	715	1689
$\langle W^{\mu\nu}u_\mu f_{+\nu}{}^{\lambda}\chi_+u_\lambda\rangle+\text{H.c.}$	276	627	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}\rangle\langle u_\rho u^\delta h_{\sigma\delta}\rangle+\text{H.c.}$		1690
$\langle W^{\mu\nu}u^\lambda f_{+\mu\nu}\chi_+u_\lambda\rangle+\text{H.c.}$	277	628	$\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma h_\sigma{}^\delta\rangle\langle W_{\mu\nu}f_{+\lambda\delta}u_\rho\rangle+\text{H.c.}$	716	1691
$\langle W^{\mu\nu}u^\lambda f_{+\mu\lambda}\chi_+u_\nu\rangle+\text{H.c.}$		629	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^{\sigma}u_\sigma u^\delta h_{\rho\delta}\rangle+\text{H.c.}$	717	1692
$\langle W^{\mu\nu}u_\mu u^\lambda f_{+\nu\lambda}\chi_+\rangle+\text{H.c.}$		630	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^{\sigma}u^\delta u_\rho h_{\sigma\delta}\rangle+\text{H.c.}$		1693
$\langle W^{\mu\nu}u^\lambda u_\mu f_{+\nu\lambda}\chi_+\rangle+\text{H.c.}$		631	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}\rangle\langle u_\sigma u^\delta h_{\rho\delta}\rangle+\text{H.c.}$		1694
$\langle W^{\mu\nu}u^\lambda u_\lambda f_{+\mu\nu}\chi_+\rangle+\text{H.c.}$		632	$\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma h_{\mu\sigma}\rangle\langle W_{\nu\lambda}f_{+\rho}{}^{\delta}u_\delta\rangle+\text{H.c.}$	718	1695
$\langle W^{\mu\nu}\rangle\langle f_{+\mu\nu}u^\lambda u_\lambda\chi_+\rangle+\text{H.c.}$	278	633	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu h^{\sigma\delta}\rangle\langle W_{\nu\lambda}f_{+\rho\sigma}u_\delta\rangle+\text{H.c.}$	719	1696
$\langle W^{\mu\nu}f_{+\mu\nu}\rangle\langle u^\lambda u_\lambda\chi_+\rangle$	279	634	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^{\sigma}u^\delta u_\sigma h_{\rho\delta}\rangle+\text{H.c.}$		1697
$\langle u^\mu\chi_+\rangle\langle W^{\nu\lambda}f_{+\nu\lambda}u_\mu\rangle+\text{H.c.}$		635	$\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma h_\mu{}^\delta\rangle\langle W_{\nu\lambda}f_{+\rho\sigma}u_\delta\rangle+\text{H.c.}$	720	1698
$\langle\chi_+\rangle\langle W^{\mu\nu}f_{+\mu\nu}u^\lambda u_\lambda\rangle+\text{H.c.}$		636	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^{\sigma}u^\delta u_\delta h_{\rho\sigma}\rangle+\text{H.c.}$		1699
$\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^{\lambda}u_\nu u_\lambda\chi_+\rangle+\text{H.c.}$	280	637	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}\rangle\langle u^\delta u_\delta h_{\rho\sigma}\rangle$		1700
$\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}\rangle\langle u_\nu u_\lambda\chi_+\rangle+\text{H.c.}$	281	638	$\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma h_\mu{}^\delta\rangle\langle W_{\nu\lambda}f_{+\rho\delta}u_\sigma\rangle+\text{H.c.}$	721	1701
$\langle f_+{}^{\mu\nu}\rangle\langle W_\mu{}^\lambda u_\lambda u_\nu\chi_+\rangle+\text{H.c.}$	282		$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_+{}^{\sigma\delta}u_\lambda u_\sigma h_{\rho\delta}\rangle+\text{H.c.}$	722	1702
$\langle f_+{}^{\mu\nu}\rangle\langle W_{\mu\nu}u^\lambda u_\lambda\chi_+\rangle+\text{H.c.}$	283		$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_+{}^{\sigma\delta}\rangle\langle u_\lambda u_\sigma h_{\rho\delta}\rangle+\text{H.c.}$		1703
$\langle u^\mu\chi_+\rangle\langle W^{\nu\lambda}f_{+\mu\nu}u_\lambda\rangle+\text{H.c.}$		639	$\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma h_\mu{}^\delta\rangle\langle W_{\nu\lambda}f_{+\sigma\delta}u_\rho\rangle+\text{H.c.}$		1704
$\langle\chi_+\rangle\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}u_\nu u_\lambda\rangle+\text{H.c.}$		640	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_+{}^{\sigma\delta}u_\sigma u_\lambda h_{\rho\delta}\rangle+\text{H.c.}$	723	1705
$\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^{\lambda}u_\lambda u_\nu\chi_+\rangle+\text{H.c.}$		641	$\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma h_\mu{}^\delta\rangle\langle W_{\nu\delta}f_{+\lambda\rho}u_\sigma\rangle+\text{H.c.}$	724	

Continued on next page

Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle u^\mu\chi_+\rangle\langle W_\mu{}^\nu f_{+\nu}{}^\lambda u_\lambda\rangle+\text{H.c.}$		642	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu h_\nu{}^\sigma\rangle\langle W_{\lambda\rho} f_{+\sigma}{}^\delta u_\delta\rangle+\text{H.c.}$		1706
$\langle\chi_+\rangle\langle W^{\mu\nu} f_{+\mu}{}^\lambda u_\lambda u_\nu\rangle+\text{H.c.}$		643	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu h_\nu{}^\sigma\rangle\langle W_\sigma{}^\delta f_{+\lambda\rho} u_\delta\rangle+\text{H.c.}$		1707
$\langle W^{\mu\nu}\rangle\langle f_{+\mu\nu} u^\lambda\chi_+ u_\lambda\rangle$		644	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda\rho} u^\sigma h_\sigma{}^\delta u_\delta\rangle$		1708
$\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^\lambda u_\nu\chi_+ u_\lambda\rangle+\text{H.c.}$		645	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^\sigma u_\rho h_\sigma{}^\delta u_\delta\rangle+\text{H.c.}$		1709
$\langle u^\mu u_\mu\rangle\langle W^{\nu\lambda} f_{+\nu\lambda}\chi_+\rangle+\text{H.c.}$		646	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^\sigma u_\sigma h_\rho{}^\delta u_\delta\rangle+\text{H.c.}$		1710
$\langle u^\mu u^\nu\rangle\langle W_\mu{}^\lambda f_{+\nu\lambda}\chi_+\rangle+\text{H.c.}$		647	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^\sigma u^\delta h_{\rho\sigma} u_\delta\rangle$		1711
$\langle W^{\mu\nu} u_\mu\rangle\langle f_{+\nu}{}^\lambda u_\lambda\chi_+\rangle+\text{H.c.}$		648	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_+{}^{\sigma\delta} u_\lambda h_{\rho\sigma} u_\delta\rangle+\text{H.c.}$		1712
$\langle\chi_+\rangle\langle W^{\mu\nu} u_\mu f_{+\nu}{}^\lambda u_\lambda\rangle+\text{H.c.}$		649	$\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u^\delta\rangle\langle W_{\mu\nu} f_{+\lambda\rho} h_{\sigma\delta}\rangle+\text{H.c.}$		1713
$\langle W^{\mu\nu} u^\lambda\rangle\langle f_{+\mu\nu} u_\lambda\chi_+\rangle+\text{H.c.}$		650	$\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u_\sigma\rangle\langle W_{\mu\nu} f_{+\lambda}{}^\delta h_{\rho\delta}\rangle+\text{H.c.}$		1714
$\langle\chi_+\rangle\langle W^{\mu\nu} u^\lambda f_{+\mu\nu} u_\lambda\rangle$		651	$\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u^\delta\rangle\langle W_{\mu\nu} f_{+\lambda\sigma} h_{\rho\delta}\rangle+\text{H.c.}$		1715
$\langle W^{\mu\nu} u^\lambda\rangle\langle f_{+\mu\lambda} u_\nu\chi_+\rangle+\text{H.c.}$		652	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda} f_{+\rho}{}^\delta h_{\sigma\delta}\rangle+\text{H.c.}$		1716
$\langle f_+{}^{\mu\nu}\chi_+\rangle\langle W_\mu{}^\lambda u_\lambda u_\nu\rangle+\text{H.c.}$		653	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda} f_{+\sigma}{}^\delta h_{\rho\delta}\rangle+\text{H.c.}$		1717
$\langle f_+{}^{\mu\nu}\chi_+\rangle\langle W_{\mu\nu} u^\lambda u_\lambda\rangle$		654	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\sigma{}^\delta f_{+\nu\lambda} h_{\rho\delta}\rangle+\text{H.c.}$		1718
$\langle f_+{}^{\mu\nu} u_\mu\rangle\langle W_\nu{}^\lambda u_\lambda\chi_+\rangle+\text{H.c.}$		655	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda\rangle\langle f_{+\rho}{}^\sigma u^\delta h_{\sigma\delta}\rangle+\text{H.c.}$	725	1719
$\langle f_+{}^{\mu\nu} u^\lambda\rangle\langle W_{\mu\nu} u_\lambda\chi_+\rangle+\text{H.c.}$		656	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda\rangle\langle f_+{}^{\sigma\delta} u_\sigma h_{\rho\delta}\rangle+\text{H.c.}$	726	1720
$\langle f_+{}^{\mu\nu} u^\lambda\rangle\langle W_{\mu\lambda} u_\nu\chi_+\rangle+\text{H.c.}$		657	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma\rangle\langle f_{+\lambda\rho} u^\delta h_{\sigma\delta}\rangle+\text{H.c.}$	727	1721
$\langle W^{\mu\nu}\nabla_\mu f_{+\nu}{}^\lambda\nabla_\lambda\chi_+\rangle+\text{H.c.}$	284	658	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma\rangle\langle f_{+\lambda\sigma} u^\delta h_{\rho\delta}\rangle+\text{H.c.}$	728	1722
$\langle W^{\mu\nu}\nabla^\lambda f_{+\mu\lambda}\nabla_\nu\chi_+\rangle+\text{H.c.}$	285	659	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma\rangle\langle f_{+\lambda}{}^\delta u_\rho h_{\sigma\delta}\rangle+\text{H.c.}$	729	1723
$\langle W^{\mu\nu}\nabla_\mu\nabla^\lambda f_{+\nu\lambda}\chi_+\rangle+\text{H.c.}$	286	660	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma\rangle\langle f_{+\lambda}{}^\delta u_\sigma h_{\rho\delta}\rangle+\text{H.c.}$	730	1724
$\langle W^{\mu\nu}\rangle\langle\nabla_\mu f_{+\nu}{}^\lambda\nabla_\lambda\chi_+\rangle$	287	661	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma\rangle\langle f_{+\lambda}{}^\delta u_\delta h_{\rho\sigma}\rangle+\text{H.c.}$	731	1725
$\langle\nabla^\mu\chi_+\rangle\langle W^{\nu\lambda}\nabla_\nu f_{+\mu\lambda}\rangle$	288	662	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^\sigma\rangle\langle W_{\nu\lambda} u^\delta u_\delta h_{\rho\sigma}\rangle+\text{H.c.}$	732	
$\langle W^{\mu\nu}\rangle\langle\nabla^\lambda f_{+\mu\lambda}\nabla_\nu\chi_+\rangle$	289	663	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^\sigma\rangle\langle W_{\nu\lambda} u_\rho h_\sigma{}^\delta u_\delta\rangle+\text{H.c.}$	733	
$\langle\nabla^\mu\chi_+\rangle\langle W_\mu{}^\nu\nabla^\lambda f_{+\nu\lambda}\rangle$	290	664	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu}\rangle\langle W_{\lambda\rho} u^\sigma h_\sigma{}^\delta u_\delta\rangle$	734	
$\langle\nabla^\mu f_{+\mu}{}^\nu\rangle\langle W_\nu{}^\lambda\nabla_\lambda\chi_+\rangle$	291		$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma\rangle\langle f_{+\sigma}{}^\delta u_\lambda h_{\rho\delta}\rangle+\text{H.c.}$		1726
$\langle\nabla^\mu f_+{}^{\nu\lambda}\rangle\langle W_{\mu\nu}\nabla_\lambda\chi_+\rangle$	292		$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^\sigma h_\sigma{}^\delta\rangle\langle W_{\nu\lambda} u_\mu u_\delta\rangle+\text{H.c.}$		1727
$\langle W^{\mu\nu}\rangle\langle\nabla_\mu\nabla^\lambda f_{+\nu\lambda}\chi_+\rangle$	293	665	$\varepsilon^{\mu\nu\lambda\rho}\langle f_+{}^{\sigma\delta} h_{\mu\sigma}\rangle\langle W_{\nu\lambda} u_\rho u_\delta\rangle+\text{H.c.}$		1728
$\langle\chi_+\rangle\langle W^{\mu\nu}\nabla_\mu\nabla^\lambda f_{+\nu\lambda}\rangle$	294	666	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^\sigma h_{\nu\sigma}\rangle\langle W_{\lambda\rho} u^\delta u_\delta\rangle$		1729
$\langle\nabla^\mu\nabla^\nu f_{+\mu}{}^\lambda\rangle\langle W_{\nu\lambda}\chi_+\rangle$	295		$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu} h^{\sigma\delta}\rangle\langle W_{\lambda\rho} u_\sigma u_\delta\rangle$		1730
$i\langle W^{\mu\nu} f_{+\mu}{}^\lambda f_{+\nu\lambda}\chi_+\rangle+\text{H.c.}$	296	667	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^\sigma h_\nu{}^\delta\rangle\langle W_{\lambda\rho} u_\sigma u_\delta\rangle+\text{H.c.}$		1731
$i\langle W^{\mu\nu} f_{+\mu}{}^\lambda\chi_+ f_{+\nu\lambda}\rangle$	297	668	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu} h_\lambda{}^\sigma\rangle\langle W_\sigma{}^\delta u_\rho u_\delta\rangle+\text{H.c.}$		1732
$i\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^\lambda f_{+\nu\lambda}\chi_+\rangle$	298	669	$\varepsilon^{\mu\nu\lambda\rho}\langle f_+{}^{\sigma\delta} u_\sigma\rangle\langle W_{\mu\nu} u_\lambda h_{\rho\delta}\rangle+\text{H.c.}$		1733
$i\langle\chi_+\rangle\langle W^{\mu\nu} f_{+\mu}{}^\lambda f_{+\nu\lambda}\rangle$		670	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^\sigma u^\delta\rangle\langle W_{\nu\lambda} u_\rho h_{\sigma\delta}\rangle+\text{H.c.}$		1734
$i\langle W^{\mu\nu} u_\mu u_\nu\chi_+^2\rangle+\text{H.c.}$	299	671	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^\sigma u_\sigma\rangle\langle W_{\nu\lambda} u^\delta h_{\rho\delta}\rangle+\text{H.c.}$		1735
$i\langle W^{\mu\nu} u_\mu\chi_+ u_\nu\chi_+\rangle+\text{H.c.}$	300	672	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^\sigma u^\delta\rangle\langle W_{\nu\lambda} u_\sigma h_{\rho\delta}\rangle+\text{H.c.}$		1736
$i\langle W^{\mu\nu} u_\mu\chi_+^2 u_\nu\rangle$	301	673	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^\sigma u^\delta\rangle\langle W_{\nu\lambda} u_\delta h_{\rho\sigma}\rangle+\text{H.c.}$		1737
$i\langle W^{\mu\nu}\chi_+ u_\mu u_\nu\chi_+\rangle$	302	674	$\varepsilon^{\mu\nu\lambda\rho}\langle f_+{}^{\sigma\delta} u_\mu\rangle\langle W_{\nu\lambda} u_\sigma h_{\rho\delta}\rangle+\text{H.c.}$		1738
$i\langle W^{\mu\nu}\rangle\langle u_\mu u_\nu\chi_+^2\rangle$		675	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu} u^\sigma\rangle\langle W_{\lambda\rho} u^\delta h_{\sigma\delta}\rangle+\text{H.c.}$		1739

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle\chi_+^2\rangle\langle W^{\mu\nu}u_\mu u_\nu\rangle$		676	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^{\sigma}u_\nu\rangle\langle W_{\lambda\rho}u^\delta h_{\sigma\delta}\rangle+\text{H.c.}$		1740
$i\langle\chi_+\rangle\langle W^{\mu\nu}u_\mu u_\nu\chi_+\rangle+\text{H.c.}$		677	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu}u^\sigma\rangle\langle W_\lambda{}^\delta u_\delta h_{\rho\sigma}\rangle+\text{H.c.}$		1741
$i\langle u^\mu\chi_+\rangle\langle W_\mu{}^\nu u_\nu\chi_+\rangle+\text{H.c.}$		678	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu}u^\sigma\rangle\langle W_\lambda{}^\delta u_\rho h_{\sigma\delta}\rangle+\text{H.c.}$		1742
$i\langle\chi_+\rangle\langle W^{\mu\nu}u_\mu\chi_+u_\nu\rangle$		679	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu}u^\sigma\rangle\langle W_\lambda{}^\delta u_\sigma h_{\rho\delta}\rangle+\text{H.c.}$		1743
$i\langle W^{\mu\nu}\chi_+\rangle\langle u_\mu u_\nu\chi_+\rangle$		680	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu}u^\sigma\rangle\langle W_{\lambda\sigma}u^\delta h_{\rho\delta}\rangle+\text{H.c.}$		1744
$i\langle W^{\mu\nu}\nabla_\mu\chi_+\nabla_\nu\chi_+\rangle$	303	681	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu}u_\lambda\rangle\langle W^{\sigma\delta}u_\sigma h_{\rho\delta}\rangle+\text{H.c.}$		1745
$\langle W^{\mu\nu}f_{+\mu\nu}\chi_+^2\rangle+\text{H.c.}$	304	682	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu}u^\sigma\rangle\langle W_\sigma{}^\delta u_\lambda h_{\rho\delta}\rangle+\text{H.c.}$		1746
$\langle W^{\mu\nu}\chi_+f_{+\mu\nu}\chi_+\rangle$	305	683	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}h_\lambda{}^\sigma\rangle\langle f_{+\rho\sigma}u^\delta u_\delta\rangle$		1747
$\langle W^{\mu\nu}\rangle\langle f_{+\mu\nu}\chi_+^2\rangle$	306	684	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}h_\lambda{}^\sigma\rangle\langle f_{+\rho}{}^\delta u_\sigma u_\delta\rangle+\text{H.c.}$		1748
$\langle W^{\mu\nu}f_{+\mu\nu}\rangle\langle\chi_+^2\rangle$	307	685	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}h_\lambda{}^\sigma\rangle\langle f_{+\sigma}{}^\delta u_\rho u_\delta\rangle+\text{H.c.}$		1749
$\langle\chi_+\rangle\langle W^{\mu\nu}f_{+\mu\nu}\chi_+\rangle+\text{H.c.}$	308	686	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}h^{\sigma\delta}\rangle\langle f_{+\lambda\rho}u_\sigma u_\delta\rangle$		1750
$\langle W^{\mu\nu}\chi_+\rangle\langle f_{+\mu\nu}\chi_+\rangle$	309	687	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}h^{\sigma\delta}\rangle\langle f_{+\lambda\sigma}u_\rho u_\delta\rangle+\text{H.c.}$		1751
$\langle f_+{}^{\mu\nu}\rangle\langle W_{\mu\nu}\chi_+^2\rangle$	310		$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma h_\sigma{}^\delta\rangle\langle f_{+\nu\lambda}u_\rho u_\delta\rangle+\text{H.c.}$		1752
$\langle W^{\mu\nu}\rangle\langle\chi_+\rangle\langle f_{+\mu\nu}\chi_+\rangle$		688	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma h_\nu{}^\delta\rangle\langle f_{+\lambda\delta}u_\sigma u_\rho\rangle+\text{H.c.}$		1753
$\langle W^{\mu\nu}u_\mu u^\lambda f_{-\nu\lambda}\chi_-\rangle+\text{H.c.}$	311	689	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}h_{\mu\sigma}\rangle\langle f_{+\nu\lambda}u_\delta u_\rho\rangle+\text{H.c.}$		1754
$\langle W^{\mu\nu}u^\lambda u_\mu f_{-\nu\lambda}\chi_-\rangle+\text{H.c.}$	312	690	$\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u_\sigma\rangle\langle W_{\mu\nu}\nabla_\lambda f_{+\rho}{}^\delta u_\delta\rangle+\text{H.c.}$		1755
$\langle W^{\mu\nu}u^\lambda u_\lambda f_{-\mu\nu}\chi_-\rangle+\text{H.c.}$	313	691	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle\nabla^\sigma f_{+\lambda\sigma}u_\rho u^\delta u_\delta\rangle+\text{H.c.}$	735	1756
$\langle W^{\mu\nu}u_\mu u^\lambda\chi_-f_{-\nu\lambda}\rangle+\text{H.c.}$	314	692	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle\nabla^\sigma f_{+\lambda}{}^\delta u_\rho u_\delta u_\sigma\rangle+\text{H.c.}$	736	
$\langle W^{\mu\nu}u^\lambda u_\mu\chi_-f_{-\nu\lambda}\rangle+\text{H.c.}$		693	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle\nabla^\sigma f_{+\lambda}{}^\delta u_\rho u_\sigma u_\delta\rangle+\text{H.c.}$		1757
$\langle W^{\mu\nu}u^\lambda u_\lambda\chi_-f_{-\mu\nu}\rangle+\text{H.c.}$		694	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^\sigma f_{+\lambda\rho}\rangle\langle u_\sigma u^\delta u_\delta\rangle$		1758
$\langle W^{\mu\nu}u_\mu f_{-\nu}{}^\lambda u_\lambda\chi_-\rangle+\text{H.c.}$	315	695	$\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u^\delta\rangle\langle W_{\mu\nu}\nabla_\sigma f_{+\lambda\rho}u_\delta\rangle+\text{H.c.}$		1759
$\langle W^{\mu\nu}u^\lambda f_{-\mu\nu}u_\lambda\chi_-\rangle+\text{H.c.}$	316	696	$\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u_\sigma\rangle\langle W_{\mu\nu}\nabla^\delta f_{+\lambda\rho}u_\delta\rangle+\text{H.c.}$		1760
$\langle W^{\mu\nu}u^\lambda f_{-\mu\lambda}u_\nu\chi_-\rangle+\text{H.c.}$	317	697	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^\sigma f_{+\lambda\sigma}\rangle\langle u_\rho u^\delta u_\delta\rangle$		1761
$\langle W^{\mu\nu}u_\mu f_{-\nu}{}^\lambda\chi_-u_\lambda\rangle+\text{H.c.}$	318	698	$\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u_\sigma\rangle\langle W_{\mu\nu}\nabla^\delta f_{+\lambda\delta}u_\rho\rangle+\text{H.c.}$		1762
$\langle W^{\mu\nu}u^\lambda f_{-\mu\nu}\chi_-u_\lambda\rangle+\text{H.c.}$	319	699	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle\nabla^\sigma f_{+\lambda\sigma}u^\delta u_\rho u_\delta\rangle$		1763
$\langle W^{\mu\nu}u^\lambda f_{-\mu\lambda}\chi_-u_\nu\rangle+\text{H.c.}$	320	700	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda}\nabla^\delta f_{+\rho\delta}u_\sigma\rangle+\text{H.c.}$		1764
$\langle W^{\mu\nu}u_\mu\chi_-u^\lambda f_{-\nu\lambda}\rangle+\text{H.c.}$		701	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\sigma}\nabla_\lambda f_{+\rho}{}^\delta u_\delta\rangle+\text{H.c.}$		1765
$\langle W^{\mu\nu}u^\lambda\chi_-u_\mu f_{-\nu\lambda}\rangle+\text{H.c.}$		702	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^\sigma f_{+\lambda}{}^\delta\rangle\langle u_\rho u_\sigma u_\delta\rangle+\text{H.c.}$		1766
$\langle W^{\mu\nu}u^\lambda\chi_-u_\lambda f_{-\mu\nu}\rangle+\text{H.c.}$		703	$\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u^\delta\rangle\langle W_{\mu\nu}\nabla_\sigma f_{+\lambda\delta}u_\rho\rangle+\text{H.c.}$		1767
$\langle W^{\mu\nu}f_{-\mu\nu}u^\lambda u_\lambda\chi_-\rangle+\text{H.c.}$		704	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle\nabla^\sigma f_{+\lambda}{}^\delta u_\sigma u_\rho u_\delta\rangle+\text{H.c.}$		1768
$\langle W^{\mu\nu}f_{-\mu}{}^\lambda u_\nu u_\lambda\chi_-\rangle+\text{H.c.}$		705	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda}\nabla^\delta f_{+\rho\sigma}u_\delta\rangle+\text{H.c.}$		1769
$\langle W^{\mu\nu}f_{-\mu}{}^\lambda u_\lambda u_\nu\chi_-\rangle+\text{H.c.}$		706	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle\nabla^\sigma f_{+\sigma}{}^\delta u_\lambda u_\rho u_\delta\rangle+\text{H.c.}$		1770
$\langle W^{\mu\nu}u_\mu u^\lambda h_{\nu\lambda}\chi_-\rangle+\text{H.c.}$	321	707	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda}\nabla_\sigma f_{+\rho}{}^\delta u_\delta\rangle+\text{H.c.}$		1771
$\langle W^{\mu\nu}u^\lambda u_\mu h_{\nu\lambda}\chi_-\rangle+\text{H.c.}$	322	708	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda}\nabla^\delta f_{+\sigma\delta}u_\rho\rangle+\text{H.c.}$		1772
$\langle W^{\mu\nu}u_\mu u^\lambda\chi_-h_{\nu\lambda}\rangle+\text{H.c.}$	323	709	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\nu{}^\delta\nabla_\delta f_{+\lambda\rho}u_\sigma\rangle+\text{H.c.}$		1773
$\langle W^{\mu\nu}u^\lambda u_\mu\chi_-h_{\nu\lambda}\rangle+\text{H.c.}$		710	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma\nabla^\delta f_{+\nu\lambda}\rangle\langle u_\rho u_\sigma u_\delta\rangle+\text{H.c.}$		1774
$\langle W^{\mu\nu}u_\mu h_\nu{}^\lambda u_\lambda\chi_-\rangle+\text{H.c.}$	324	711	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\nu{}^\delta\nabla_\sigma f_{+\lambda\rho}u_\delta\rangle+\text{H.c.}$		1775

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle W^{\mu\nu}u^\lambda h_{\mu\lambda}u_\nu\chi_-\rangle+\text{H.c.}$	325	712	$\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u^\delta\rangle\langle W_{\mu\sigma}\nabla_\delta f_{+\nu\lambda}u_\rho\rangle+\text{H.c.}$		1776
$\langle W^{\mu\nu}u_\mu h_\nu{}^\lambda\chi_-u_\lambda\rangle+\text{H.c.}$	326	713	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\sigma{}^\delta\nabla_\delta f_{+\nu\lambda}u_\rho\rangle+\text{H.c.}$		1777
$\langle W^{\mu\nu}u^\lambda h_{\mu\lambda}\chi_-u_\nu\rangle+\text{H.c.}$	327	714	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_\sigma{}^\delta\nabla_\nu f_{+\lambda\rho}u_\delta\rangle+\text{H.c.}$		1778
$\langle W^{\mu\nu}u_\mu\chi_-u^\lambda h_{\nu\lambda}\rangle+\text{H.c.}$		715	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\rangle\langle\nabla^\sigma f_{+\rho\sigma}u^\delta u_\delta\rangle$		1779
$\langle W^{\mu\nu}u^\lambda\chi_-u_\mu h_{\nu\lambda}\rangle+\text{H.c.}$		716	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\rangle\langle\nabla^\sigma f_{+\rho}{}^\delta u_\sigma u_\delta\rangle+\text{H.c.}$		1780
$\langle W^{\mu\nu}h_\mu{}^\lambda u_\nu u_\lambda\chi_-\rangle+\text{H.c.}$		717	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\rangle\langle\nabla^\sigma f_{+\sigma}{}^\delta u_\rho u_\delta\rangle+\text{H.c.}$		1781
$\langle W^{\mu\nu}h_\mu{}^\lambda u_\lambda u_\nu\chi_-\rangle+\text{H.c.}$		718	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\rangle\langle\nabla_\lambda f_{+\sigma}{}^\delta u_\rho u_\delta\rangle+\text{H.c.}$		1782
$\langle W^{\mu\nu}u_\mu u_\nu u^\lambda\nabla_\lambda\chi_-\rangle+\text{H.c.}$	328	719	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\rangle\langle\nabla_\sigma f_{+\lambda\rho}u^\delta u_\delta\rangle$		1783
$\langle W^{\mu\nu}u_\mu u^\lambda u_\nu\nabla_\lambda\chi_-\rangle+\text{H.c.}$		720	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\rangle\langle\nabla^\delta f_{+\lambda\rho}u_\delta u_\sigma\rangle+\text{H.c.}$		1784
$\langle W^{\mu\nu}u_\mu u^\lambda u_\lambda\nabla_\nu\chi_-\rangle+\text{H.c.}$	329	721	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\rangle\langle\nabla_\sigma f_{+\lambda}{}^\delta u_\rho u_\delta\rangle+\text{H.c.}$		1785
$\langle W^{\mu\nu}u^\lambda u_\mu u_\lambda\nabla_\nu\chi_-\rangle+\text{H.c.}$	330	722	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\rangle\langle\nabla^\delta f_{+\lambda\delta}u_\rho u_\sigma\rangle+\text{H.c.}$		1786
$\langle W^{\mu\nu}u^\lambda u_\lambda u_\mu\nabla_\nu\chi_-\rangle+\text{H.c.}$		723	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\rangle\langle\nabla^\delta f_{+\lambda\sigma}u_\rho u_\delta\rangle+\text{H.c.}$		1787
$\langle W^{\mu\nu}u_\mu u_\nu\nabla^\lambda\chi_-u_\lambda\rangle+\text{H.c.}$	331	724	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma\rangle\langle\nabla^\delta f_{+\nu\lambda}u_\rho u_\delta\rangle+\text{H.c.}$		1788
$\langle W^{\mu\nu}u_\mu u^\lambda\nabla_\nu\chi_-u_\lambda\rangle+\text{H.c.}$	332	725	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta\rangle\langle\nabla_\delta f_{+\nu\lambda}u_\rho u_\sigma\rangle+\text{H.c.}$		1789
$\langle W^{\mu\nu}u_\mu u^\lambda\nabla_\lambda\chi_-u_\nu\rangle+\text{H.c.}$		726	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_\mu\rangle\langle\nabla_\sigma f_{+\nu\lambda}u_\delta u_\rho\rangle+\text{H.c.}$		1790
$\langle W^{\mu\nu}u^\lambda u_\mu\nabla_\nu\chi_-u_\lambda\rangle+\text{H.c.}$		727	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla_\mu f_+{}^{\sigma\delta}u_\sigma\rangle\langle W_{\nu\lambda}u_\rho u_\delta\rangle+\text{H.c.}$		1791
$\langle W^{\mu\nu}u^\lambda u_\lambda\nabla_\mu\chi_-u_\nu\rangle+\text{H.c.}$		728	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla^\sigma f_{+\mu}{}^\delta u_\delta\rangle\langle W_{\nu\lambda}u_\rho u_\sigma\rangle+\text{H.c.}$		1792
$\langle W^{\mu\nu}\rangle\langle u_\mu u^\lambda f_{-\nu\lambda}\chi_-\rangle+\text{H.c.}$		729	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla^\sigma f_{+\mu}{}^\delta u_\sigma\rangle\langle W_{\nu\lambda}u_\rho u_\delta\rangle+\text{H.c.}$		1793
$\langle W^{\mu\nu}u_\mu\rangle\langle u^\lambda f_{-\nu\lambda}\chi_-\rangle+\text{H.c.}$		730	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla^\sigma f_{+\mu\sigma}u^\delta\rangle\langle W_{\nu\lambda}u_\rho u_\delta\rangle+\text{H.c.}$		1794
$\langle f_-{}^{\mu\nu}\chi_-\rangle\langle W_\mu{}^\lambda u_\lambda u_\nu\rangle+\text{H.c.}$		731	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla^\sigma f_{+\sigma}{}^\delta u_\mu\rangle\langle W_{\nu\lambda}u_\rho u_\delta\rangle+\text{H.c.}$		1795
$\langle\chi_-\rangle\langle W^{\mu\nu}u_\mu u^\lambda f_{-\nu\lambda}\rangle+\text{H.c.}$		732	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla_\mu f_{+\nu}{}^\sigma u_\sigma\rangle\langle W_{\lambda\rho}u^\delta u_\delta\rangle$		1796
$\langle W^{\mu\nu}\rangle\langle u^\lambda u_\mu f_{-\nu\lambda}\chi_-\rangle+\text{H.c.}$		733	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla^\sigma f_{+\mu\nu}u_\sigma\rangle\langle W_{\lambda\rho}u^\delta u_\delta\rangle$		1797
$\langle W^{\mu\nu}u^\lambda\rangle\langle u_\mu f_{-\nu\lambda}\chi_-\rangle+\text{H.c.}$		734	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla^\sigma f_{+\mu\sigma}u_\nu\rangle\langle W_{\lambda\rho}u^\delta u_\delta\rangle$		1798
$\langle\chi_-\rangle\langle W^{\mu\nu}u^\lambda u_\mu f_{-\nu\lambda}\rangle+\text{H.c.}$		735	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla^\sigma f_{+\mu\nu}u^\delta\rangle\langle W_{\lambda\sigma}u_\rho u_\delta\rangle+\text{H.c.}$		1799
$\langle W^{\mu\nu}\rangle\langle u^\lambda u_\lambda f_{-\mu\nu}\chi_-\rangle+\text{H.c.}$		736	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla_\mu f_{+\nu}{}^\sigma u^\delta\rangle\langle W_{\lambda\rho}u_\sigma u_\delta\rangle+\text{H.c.}$		1800
$\langle W^{\mu\nu}u^\lambda\rangle\langle u_\lambda f_{-\mu\nu}\chi_-\rangle+\text{H.c.}$		737	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla^\sigma f_{+\mu\nu}u^\delta\rangle\langle W_{\lambda\rho}u_\sigma u_\delta\rangle+\text{H.c.}$		1801
$\langle\chi_-\rangle\langle W^{\mu\nu}u^\lambda u_\lambda f_{-\mu\nu}\rangle+\text{H.c.}$		738	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla^\sigma f_{+\mu}{}^\delta u_\nu\rangle\langle W_{\lambda\rho}u_\sigma u_\delta\rangle+\text{H.c.}$		1802
$\langle W^{\mu\nu}\rangle\langle u_\mu f_{-\nu}{}^\lambda u_\lambda\chi_-\rangle+\text{H.c.}$		739	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla_\mu f_{+\nu}{}^\sigma u_\sigma\rangle\langle W_\lambda{}^\delta u_\delta u_\rho\rangle+\text{H.c.}$		1803
$\langle u^\mu\chi_-\rangle\langle W^{\nu\lambda}u_\nu f_{-\mu\lambda}\rangle+\text{H.c.}$		740	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla^\sigma f_{+\mu\nu}u_\sigma\rangle\langle W_\lambda{}^\delta u_\delta u_\rho\rangle+\text{H.c.}$		1804
$\langle\chi_-\rangle\langle W^{\mu\nu}u_\mu f_{-\nu}{}^\lambda u_\lambda\rangle+\text{H.c.}$		741	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla^\sigma f_{+\mu\sigma}u_\nu\rangle\langle W_\lambda{}^\delta u_\delta u_\rho\rangle+\text{H.c.}$		1805
$\langle W^{\mu\nu}\chi_-\rangle\langle u_\mu u^\lambda f_{-\nu\lambda}\rangle+\text{H.c.}$		742	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla^\sigma f_{+\mu\nu}u_\lambda\rangle\langle W_\rho{}^\delta u_\delta u_\sigma\rangle+\text{H.c.}$		1806
$\langle W^{\mu\nu}\rangle\langle u_\mu u^\lambda h_{\nu\lambda}\chi_-\rangle+\text{H.c.}$		743	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla^\sigma f_{+\mu\nu}u_\lambda\rangle\langle W_\sigma{}^\delta u_\rho u_\delta\rangle+\text{H.c.}$		1807
$\langle W^{\mu\nu}u_\mu\rangle\langle u^\lambda h_{\nu\lambda}\chi_-\rangle+\text{H.c.}$		744	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla^\sigma f_{+\mu}{}^\delta u_\nu\rangle\langle W_{\lambda\sigma}u_\rho u_\delta\rangle+\text{H.c.}$		1808
$\langle h^{\mu\nu}\chi_-\rangle\langle W_\mu{}^\lambda u_\lambda u_\nu\rangle+\text{H.c.}$		745	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla^\sigma f_{+\mu\nu}u^\delta\rangle\langle W_{\lambda\delta}u_\rho u_\sigma\rangle+\text{H.c.}$		1809
$\langle\chi_-\rangle\langle W^{\mu\nu}u_\mu u^\lambda h_{\nu\lambda}\rangle+\text{H.c.}$		746	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla^\sigma f_{+\mu\nu}u_\lambda\rangle\langle W_{\rho\sigma}u^\delta u_\delta\rangle$		1810
$\langle W^{\mu\nu}\rangle\langle u^\lambda u_\mu h_{\nu\lambda}\chi_-\rangle+\text{H.c.}$		747	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda\rho}u^\sigma\rangle\langle u^\delta f_{-\sigma\delta}\rangle$		1811
$\langle W^{\mu\nu}u^\lambda\rangle\langle u_\mu h_{\nu\lambda}\chi_-\rangle+\text{H.c.}$		748	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^\sigma u_\sigma\rangle\langle u^\delta f_{-\rho\delta}\rangle$		1812

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle\chi_-\rangle\langle W^{\mu\nu}u^\lambda u_\mu h_{\nu\lambda}\rangle+\text{H.c.}$		749	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_+{}^{\sigma\delta}u_\lambda\rangle\langle u_\rho f_{-\sigma\delta}\rangle$		1813
$\langle W^{\mu\nu}\rangle\langle u_\mu h_\nu{}^\lambda u_\lambda\chi_-\rangle+\text{H.c.}$		750	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_+{}^{\sigma\delta}u_\sigma\rangle\langle u_\delta f_{-\lambda\rho}\rangle$		1814
$\langle u^\mu\chi_-\rangle\langle W^{\nu\lambda}u_\nu h_{\mu\lambda}\rangle+\text{H.c.}$		751	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}\rangle\langle f_{+\sigma\delta}u_\mu\rangle\langle u_\nu f_{-\lambda\rho}\rangle$		1815
$\langle\chi_-\rangle\langle W^{\mu\nu}u_\mu h_\nu{}^\lambda u_\lambda\rangle+\text{H.c.}$		752	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}\rangle\langle f_{+\mu\nu}u_\sigma\rangle\langle u_\delta f_{-\lambda\rho}\rangle$		1816
$\langle W^{\mu\nu}\chi_-\rangle\langle u_\mu u^\lambda h_{\nu\lambda}\rangle+\text{H.c.}$		753	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^\sigma f_{-\sigma}{}^\delta\rangle\langle u_\rho u_\delta\rangle$		1817
$\langle W^{\mu\nu}\rangle\langle u_\mu u_\nu u^\lambda\nabla_\lambda\chi_-\rangle+\text{H.c.}$		754	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda\rho}u^\sigma\rangle\langle u^\delta h_{\sigma\delta}\rangle$		1818
$\langle W^{\mu\nu}u_\mu\rangle\langle u_\nu u^\lambda\nabla_\lambda\chi_-\rangle+\text{H.c.}$		755	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^\sigma u_\rho\rangle\langle u^\delta h_{\sigma\delta}\rangle$		1819
$\langle u^\mu\nabla_\mu\chi_-\rangle\langle W^{\nu\lambda}u_\nu u_\lambda\rangle$		756	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^\sigma u^\delta\rangle\langle u_\rho h_{\sigma\delta}\rangle$		1820
$\langle W^{\mu\nu}\rangle\langle u_\mu u^\lambda u_\lambda\nabla_\nu\chi_-\rangle+\text{H.c.}$		757	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^\sigma u^\delta\rangle\langle u_\sigma h_{\rho\delta}\rangle$		1821
$\langle u^\mu\nabla^\nu\chi_-\rangle\langle W_\nu{}^\lambda u_\lambda u_\mu\rangle+\text{H.c.}$		758	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_+{}^{\sigma\delta}u_\lambda\rangle\langle u_\sigma h_{\rho\delta}\rangle$		1822
$\langle\nabla^\mu\chi_-\rangle\langle W_\mu{}^\nu u_\nu u^\lambda u_\lambda\rangle+\text{H.c.}$		759	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_+{}^{\sigma\delta}u_\sigma\rangle\langle u_\lambda h_{\rho\delta}\rangle$		1823
$\langle W^{\mu\nu}\nabla_\mu f_{-\nu}{}^\lambda\nabla_\lambda\chi_-\rangle+\text{H.c.}$	333	760	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}\rangle\langle f_{+\mu\nu}u_\sigma\rangle\langle u_\lambda h_{\rho\delta}\rangle$		1824
$\langle W^{\mu\nu}\nabla^\lambda f_{-\mu\lambda}\nabla_\nu\chi_-\rangle+\text{H.c.}$	334	761	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}\rangle\langle f_{+\mu\nu}u_\lambda\rangle\langle u_\sigma h_{\rho\delta}\rangle$		1825
$\langle W^{\mu\nu}\nabla_\mu\nabla^\lambda f_{-\nu\lambda}\chi_-\rangle+\text{H.c.}$	335	762	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda\rho}h^{\sigma\delta}\rangle\langle u_\sigma u_\delta\rangle$		1826
$\langle W^{\mu\nu}h_\mu{}^\lambda\nabla_\nu\nabla_\lambda\chi_-\rangle+\text{H.c.}$	336	763	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^\sigma h_{\rho\sigma}\rangle\langle u^\delta u_\delta\rangle$		1827
$i\langle W^{\mu\nu}f_{+\mu}{}^\lambda f_{-\nu\lambda}\chi_-\rangle+\text{H.c.}$	337	764	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_+{}^{\sigma\delta}h_{\lambda\sigma}\rangle\langle u_\rho u_\delta\rangle$		1828
$i\langle W^{\mu\nu}f_{+\mu}{}^\lambda\chi_-f_{-\nu\lambda}\rangle+\text{H.c.}$	338	765	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle\nabla_\lambda f_{+\rho}{}^\sigma u_\sigma\rangle\langle u^\delta u_\delta\rangle$		1829
$i\langle W^{\mu\nu}f_{-\mu}{}^\lambda f_{+\nu\lambda}\chi_-\rangle+\text{H.c.}$	339	766	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle\nabla^\sigma f_{+\lambda\rho}u^\delta\rangle\langle u_\sigma u_\delta\rangle$		1830
$i\langle W^{\mu\nu}f_{+\mu}{}^\lambda h_{\nu\lambda}\chi_-\rangle+\text{H.c.}$	340	767	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle\nabla_\lambda f_+{}^{\sigma\delta}u_\sigma\rangle\langle u_\rho u_\delta\rangle$		1831
$i\langle W^{\mu\nu}f_{+\mu}{}^\lambda\chi_-h_{\nu\lambda}\rangle+\text{H.c.}$	341	768	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle\nabla^\sigma f_{+\lambda\sigma}u^\delta\rangle\langle u_\rho u_\delta\rangle$		1832
$i\langle W^{\mu\nu}h_\mu{}^\lambda f_{+\nu\lambda}\chi_-\rangle+\text{H.c.}$	342	769	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle\nabla^\sigma f_{+\lambda\rho}u_\sigma\rangle\langle u^\delta u_\delta\rangle$		1833
$i\langle W^{\mu\nu}\nabla_\mu f_{+\nu}{}^\lambda u_\lambda\chi_-\rangle+\text{H.c.}$	343	770	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle\nabla^\sigma f_{+\lambda\sigma}u_\rho\rangle\langle u^\delta u_\delta\rangle$		1834
$i\langle W^{\mu\nu}\nabla^\lambda f_{+\mu\lambda}u_\nu\chi_-\rangle+\text{H.c.}$	344	771	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle\nabla^\sigma f_{+\lambda}{}^\delta u_\rho\rangle\langle u_\sigma u_\delta\rangle$		1835
$i\langle W^{\mu\nu}\nabla_\mu f_{+\nu}{}^\lambda\chi_-u_\lambda\rangle+\text{H.c.}$	345	772	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle\nabla^\sigma f_{+\sigma}{}^\delta u_\lambda\rangle\langle u_\rho u_\delta\rangle$		1836
$i\langle W^{\mu\nu}\nabla^\lambda f_{+\mu\lambda}\chi_-u_\nu\rangle+\text{H.c.}$	346	773	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma\rangle\langle\nabla_\sigma f_{+\nu\lambda}u_\rho\rangle\langle u^\delta u_\delta\rangle$		1837
$i\langle W^{\mu\nu}u_\mu\nabla^\lambda f_{+\nu\lambda}\chi_-\rangle+\text{H.c.}$	347	774	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma\rangle\langle\nabla^\delta f_{+\nu\lambda}u_\rho\rangle\langle u_\sigma u_\delta\rangle$		1838
$i\langle W^{\mu\nu}u^\lambda\nabla_\mu f_{+\nu\lambda}\chi_-\rangle+\text{H.c.}$	348	775	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}\rangle\langle\nabla_\sigma f_{+\mu\nu}u_\lambda\rangle\langle u_\rho u_\delta\rangle$		1839
$i\langle W^{\mu\nu}f_{+\mu\nu}u^\lambda\nabla_\lambda\chi_-\rangle+\text{H.c.}$	349	776	$\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}\rangle\langle\nabla_\mu f_{+\nu\lambda}u_\sigma\rangle\langle u_\rho u_\delta\rangle$		1840
$i\langle W^{\mu\nu}f_{+\mu}{}^\lambda u_\lambda\nabla_\nu\chi_-\rangle+\text{H.c.}$	350	777	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda\rho}f_+{}^{\sigma\delta}f_{-\sigma\delta}\rangle+\text{H.c.}$	737	1841
$i\langle W^{\mu\nu}f_{+\mu\nu}\nabla^\lambda\chi_-u_\lambda\rangle+\text{H.c.}$	351	778	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma f_{+\rho}{}^\delta f_{-\sigma\delta}\rangle+\text{H.c.}$	738	1842
$i\langle W^{\mu\nu}f_{+\mu}{}^\lambda\nabla_\nu\chi_-u_\lambda\rangle+\text{H.c.}$	352	779	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma f_{+\sigma}{}^\delta f_{-\rho\delta}\rangle+\text{H.c.}$	739	1843
$i\langle W^{\mu\nu}u_\mu f_{+\nu}{}^\lambda\nabla_\lambda\chi_-\rangle+\text{H.c.}$	353	780	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_+{}^{\sigma\delta}f_{+\lambda\rho}f_{-\sigma\delta}\rangle+\text{H.c.}$	740	1844
$i\langle W^{\mu\nu}u^\lambda f_{+\mu\lambda}\nabla_\nu\chi_-\rangle+\text{H.c.}$	354	781	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_+{}^{\sigma\delta}f_{+\lambda\sigma}f_{-\rho\delta}\rangle+\text{H.c.}$	741	1845
$i\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^\lambda f_{-\nu\lambda}\chi_-\rangle+\text{H.c.}$	355	782	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_+{}^{\sigma\delta}f_{+\sigma\delta}f_{-\lambda\rho}\rangle+\text{H.c.}$	742	1846
$i\langle W^{\mu\nu}f_{+\mu}{}^\lambda\rangle\langle f_{-\nu\lambda}\chi_-\rangle$	356	783	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\nu\sigma}f_{+\lambda}{}^\delta f_{-\rho\delta}\rangle+\text{H.c.}$		1847
$i\langle f_+{}^{\mu\nu}\rangle\langle W_\mu{}^\lambda f_{-\nu\lambda}\chi_-\rangle+\text{H.c.}$	357		$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\sigma}{}^\delta f_{+\nu\lambda}f_{-\rho\delta}\rangle+\text{H.c.}$		1848
$i\langle\chi_-\rangle\langle W^{\mu\nu}f_{+\mu}{}^\lambda f_{-\nu\lambda}\rangle+\text{H.c.}$		784	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma f_{+\sigma}{}^\delta f_{+\nu\delta}f_{-\lambda\rho}\rangle+\text{H.c.}$		1849

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle W^{\mu\nu}f_{-\mu}{}^{\lambda}\rangle\langle f_{+\nu\lambda}\chi_-\rangle$		785	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\nu\lambda}f_{+\sigma}{}^{\delta}f_{-\rho\delta}\rangle+\text{H.c.}$		1850
$i\langle W^{\mu\nu}\chi_-\rangle\langle f_{+\mu}{}^{\lambda}f_{-\nu\lambda}\rangle$		786	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\nu}{}^{\delta}f_{+\lambda\sigma}f_{-\rho\delta}\rangle+\text{H.c.}$		1851
$i\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^{\lambda}h_{\nu\lambda}\chi_-\rangle+\text{H.c.}$	358	787	$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}f_{+\mu\nu}f_{+\sigma\delta}f_{-\lambda\rho}\rangle+\text{H.c.}$		1852
$i\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}\rangle\langle h_{\nu\lambda}\chi_-\rangle$	359	788	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda\rho}f_{-}{}^{\sigma\delta}f_{+\sigma\delta}\rangle+\text{H.c.}$		1853
$i\langle f_{+}{}^{\mu\nu}\rangle\langle W_{\mu}{}^{\lambda}h_{\nu\lambda}\chi_-\rangle+\text{H.c.}$	360		$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}f_{-\rho}{}^{\delta}f_{+\sigma\delta}\rangle+\text{H.c.}$	743	1854
$i\langle\chi_-\rangle\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}h_{\nu\lambda}\rangle+\text{H.c.}$		789	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}f_{+\rho}{}^{\delta}h_{\sigma\delta}\rangle+\text{H.c.}$	744	1855
$i\langle W^{\mu\nu}h_{\mu}{}^{\lambda}\rangle\langle f_{+\nu\lambda}\chi_-\rangle$		790	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}f_{+\sigma}{}^{\delta}h_{\rho\delta}\rangle+\text{H.c.}$	745	1856
$i\langle W^{\mu\nu}\chi_-\rangle\langle f_{+\mu}{}^{\lambda}h_{\nu\lambda}\rangle$		791	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+}{}^{\sigma\delta}f_{+\lambda\sigma}h_{\rho\delta}\rangle+\text{H.c.}$	746	1857
$i\langle W^{\mu\nu}\rangle\langle\nabla_{\mu}f_{+\nu}{}^{\lambda}u_{\lambda}\chi_-\rangle+\text{H.c.}$	361	792	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\nu\sigma}f_{+\lambda}{}^{\delta}h_{\rho\delta}\rangle+\text{H.c.}$		1858
$i\langle W^{\mu\nu}\nabla_{\mu}f_{+\nu}{}^{\lambda}\rangle\langle u_{\lambda}\chi_-\rangle$	362	793	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\sigma}{}^{\delta}f_{+\nu\lambda}h_{\rho\delta}\rangle+\text{H.c.}$		1859
$i\langle\chi_-\rangle\langle W^{\mu\nu}\nabla_{\mu}f_{+\nu}{}^{\lambda}u_{\lambda}\rangle+\text{H.c.}$		794	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\nu\lambda}f_{+\sigma}{}^{\delta}h_{\rho\delta}\rangle+\text{H.c.}$		1860
$i\langle\chi_-\rangle\langle W^{\mu\nu}\nabla^{\lambda}f_{+\mu\lambda}u_{\nu}\rangle+\text{H.c.}$	363	795	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}h_{\rho}{}^{\delta}f_{+\sigma\delta}\rangle+\text{H.c.}$	747	1861
$i\langle W^{\mu\nu}\rangle\langle\nabla^{\lambda}f_{+\mu\lambda}u_{\nu}\chi_-\rangle+\text{H.c.}$	364	796	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}h_{\sigma}{}^{\delta}f_{+\rho\delta}\rangle$	748	1862
$i\langle\nabla^{\mu}f_{+\mu}{}^{\nu}\rangle\langle W_{\nu}{}^{\lambda}u_{\lambda}\chi_-\rangle+\text{H.c.}$	365		$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda\rho}\nabla^{\sigma}f_{+\sigma}{}^{\delta}u_{\delta}\rangle+\text{H.c.}$	749	1863
$i\langle\nabla^{\mu}f_{+}{}^{\nu\lambda}\rangle\langle W_{\mu\nu}u_{\lambda}\chi_-\rangle+\text{H.c.}$	366		$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}\nabla_{\rho}f_{+\sigma}{}^{\delta}u_{\delta}\rangle+\text{H.c.}$	750	1864
$i\langle W^{\mu\nu}\nabla^{\lambda}f_{+\mu\lambda}\rangle\langle u_{\nu}\chi_-\rangle$		797	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}\nabla_{\sigma}f_{+\rho}{}^{\delta}u_{\delta}\rangle+\text{H.c.}$	751	1865
$i\langle W^{\mu\nu}u_{\mu}\rangle\langle\nabla^{\lambda}f_{+\nu\lambda}\chi_-\rangle$		798	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}\nabla^{\delta}f_{+\rho\sigma}u_{\delta}\rangle+\text{H.c.}$		1866
$i\langle W^{\mu\nu}u^{\lambda}\rangle\langle\nabla_{\mu}f_{+\nu\lambda}\chi_-\rangle$		799	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}\nabla^{\delta}f_{+\rho\delta}u_{\sigma}\rangle+\text{H.c.}$	752	1867
$i\langle W^{\mu\nu}\chi_-\rangle\langle\nabla_{\mu}f_{+\nu}{}^{\lambda}u_{\lambda}\rangle$		800	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}\nabla^{\delta}f_{+\sigma\delta}u_{\rho}\rangle+\text{H.c.}$	753	1868
$i\langle W^{\mu\nu}\chi_-\rangle\langle\nabla^{\lambda}f_{+\mu\lambda}u_{\nu}\rangle$		801	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+}{}^{\sigma\delta}\nabla_{\lambda}f_{+\rho\sigma}u_{\delta}\rangle+\text{H.c.}$		1869
$i\langle W^{\mu\nu}\rangle\langle f_{+\mu\nu}u^{\lambda}\nabla_{\lambda}\chi_-\rangle+\text{H.c.}$	367	802	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+}{}^{\sigma\delta}\nabla_{\lambda}f_{+\sigma\delta}u_{\rho}\rangle+\text{H.c.}$		1870
$i\langle W^{\mu\nu}f_{+\mu\nu}\rangle\langle u^{\lambda}\nabla_{\lambda}\chi_-\rangle$	368	803	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+}{}^{\sigma\delta}\nabla_{\sigma}f_{+\lambda\rho}u_{\delta}\rangle+\text{H.c.}$		1871
$i\langle\nabla^{\mu}\chi_-\rangle\langle W^{\nu\lambda}f_{+\nu\lambda}u_{\mu}\rangle+\text{H.c.}$		804	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+}{}^{\sigma\delta}\nabla_{\sigma}f_{+\lambda\delta}u_{\rho}\rangle+\text{H.c.}$		1872
$i\langle W^{\mu\nu}\rangle\langle f_{+\mu}{}^{\lambda}u_{\lambda}\nabla_{\nu}\chi_-\rangle+\text{H.c.}$	369	805	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\nu\sigma}\nabla^{\delta}f_{+\lambda\delta}u_{\rho}\rangle+\text{H.c.}$		1873
$i\langle W^{\mu\nu}f_{+\mu}{}^{\lambda}\rangle\langle u_{\lambda}\nabla_{\nu}\chi_-\rangle$	370	806	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\nu}{}^{\delta}\nabla_{\sigma}f_{+\lambda\rho}u_{\delta}\rangle+\text{H.c.}$		1874
$i\langle f_{+}{}^{\mu\nu}\rangle\langle W_{\mu}{}^{\lambda}u_{\lambda}\nabla_{\nu}\chi_-\rangle+\text{H.c.}$	371		$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\sigma}{}^{\delta}\nabla_{\nu}f_{+\lambda\delta}u_{\rho}\rangle+\text{H.c.}$		1875
$i\langle f_{+}{}^{\mu\nu}\rangle\langle W_{\mu}{}^{\lambda}u_{\nu}\nabla_{\lambda}\chi_-\rangle+\text{H.c.}$	372		$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\nu\lambda}\nabla_{\sigma}f_{+\rho}{}^{\delta}u_{\delta}\rangle+\text{H.c.}$		1876
$i\langle\nabla^{\mu}\chi_-\rangle\langle W_{\mu}{}^{\nu}f_{+\nu}{}^{\lambda}u_{\lambda}\rangle+\text{H.c.}$		807	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu}{}^{\sigma}f_{+\nu\lambda}\nabla^{\delta}f_{+\sigma\delta}u_{\rho}\rangle+\text{H.c.}$		1877
$i\langle W^{\mu\nu}u_{\mu}\rangle\langle f_{+\nu}{}^{\lambda}\nabla_{\lambda}\chi_-\rangle$		808	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda\rho}u^{\sigma}\nabla^{\delta}f_{+\sigma\delta}\rangle+\text{H.c.}$		1878
$i\langle W^{\mu\nu}u^{\lambda}\rangle\langle f_{+\mu\lambda}\nabla_{\nu}\chi_-\rangle$		809	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}u_{\rho}\nabla^{\delta}f_{+\sigma\delta}\rangle+\text{H.c.}$		1879
$i\langle W^{\mu\nu}\nabla_{\mu}\chi_-\rangle\langle f_{+\nu}{}^{\lambda}u_{\lambda}\rangle$		810	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}u_{\sigma}\nabla^{\delta}f_{+\rho\delta}\rangle+\text{H.c.}$		1880
$i\langle W^{\mu\nu}\nabla^{\lambda}\chi_-\rangle\langle f_{+\mu\nu}u_{\lambda}\rangle$		811	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}u^{\delta}\nabla_{\rho}f_{+\sigma\delta}\rangle+\text{H.c.}$		1881
$\langle W^{\mu\nu}f_{-\mu\nu}\chi_+\chi_-\rangle+\text{H.c.}$	373	812	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^{\sigma}u^{\delta}\nabla_{\sigma}f_{+\rho\delta}\rangle+\text{H.c.}$		1882
$\langle W^{\mu\nu}f_{-\mu\nu}\chi_-\chi_+\rangle+\text{H.c.}$	374	813	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+}{}^{\sigma\delta}u_{\lambda}\nabla_{\rho}f_{+\sigma\delta}\rangle+\text{H.c.}$		1883
$\langle W^{\mu\nu}\chi_+f_{-\mu\nu}\chi_-\rangle+\text{H.c.}$	375	814	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla_{\lambda}f_{+\rho}{}^{\sigma}f_{+\sigma}{}^{\delta}u_{\delta}\rangle+\text{H.c.}$		1884
$\langle W^{\mu\nu}u_{\mu}\nabla_{\nu}\chi_+\chi_-\rangle+\text{H.c.}$	376	815	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^{\sigma}f_{+\lambda}{}^{\delta}f_{+\rho\delta}u_{\sigma}\rangle+\text{H.c.}$		1885

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle W^{\mu\nu}u_\mu\chi_-\nabla_\nu\chi_+\rangle+\text{H.c.}$	377	816	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^\sigma f_{+\sigma}{}^\delta f_{+\lambda\rho}u_\delta\rangle+\text{H.c.}$		1886
$\langle W^{\mu\nu}\nabla_\mu\chi_+u_\nu\chi_-\rangle+\text{H.c.}$	378	817	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^\sigma f_{+\sigma}{}^\delta f_{+\lambda\delta}u_\rho\rangle+\text{H.c.}$		1887
$\langle W^{\mu\nu}u_\mu\chi_+\nabla_\nu\chi_-\rangle+\text{H.c.}$	379	818	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda\rho}f_+{}^{\sigma\delta}f_{-\sigma\delta}\rangle+\text{H.c.}$		1888
$\langle W^{\mu\nu}u_\mu\nabla_\nu\chi_-\chi_+\rangle+\text{H.c.}$	380	819	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^\sigma f_{+\sigma}{}^\delta f_{-\rho\delta}\rangle+\text{H.c.}$		1889
$\langle W^{\mu\nu}\chi_+u_\mu\nabla_\nu\chi_-\rangle+\text{H.c.}$	381	820	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^\sigma f_{+\rho}{}^\delta h_{\sigma\delta}\rangle$		1890
$\langle W^{\mu\nu}\rangle\langle f_{-\mu\nu}\chi_+\chi_-\rangle+\text{H.c.}$		821	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^\sigma f_{+\sigma}{}^\delta h_{\rho\delta}\rangle+\text{H.c.}$		1891
$\langle\chi_-\rangle\langle W^{\mu\nu}f_{-\mu\nu}\chi_+\rangle+\text{H.c.}$		822	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda\rho}\nabla^\sigma f_{+\sigma}{}^\delta u_\delta\rangle+\text{H.c.}$		1892
$\langle\chi_+\rangle\langle W^{\mu\nu}f_{-\mu\nu}\chi_-\rangle+\text{H.c.}$		823	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^\sigma\nabla_\rho f_{+\sigma}{}^\delta u_\delta\rangle+\text{H.c.}$		1893
$\langle W^{\mu\nu}\rangle\langle u_\mu\nabla_\nu\chi_+\chi_-\rangle+\text{H.c.}$		824	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma f_{-\rho\sigma}\chi_+\rangle+\text{H.c.}$	754	1894
$\langle\chi_-\rangle\langle W^{\mu\nu}u_\mu\nabla_\nu\chi_+\rangle+\text{H.c.}$		825	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda f_{-\rho\sigma}\chi_+\rangle+\text{H.c.}$	755	1895
$\langle\nabla^\mu\chi_+\rangle\langle W_\mu{}^\nu u_\nu\chi_-\rangle+\text{H.c.}$		826	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\sigma f_{-\lambda\rho}\chi_+\rangle+\text{H.c.}$	756	1896
$\langle W^{\mu\nu}\rangle\langle u_\mu\chi_+\nabla_\nu\chi_-\rangle+\text{H.c.}$		827	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma\chi_+f_{-\rho\sigma}\rangle+\text{H.c.}$	757	1897
$\langle\nabla^\mu\chi_-\rangle\langle W_\mu{}^\nu u_\nu\chi_+\rangle+\text{H.c.}$		828	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda\chi_+f_{-\rho\sigma}\rangle+\text{H.c.}$		1898
$\langle\chi_+\rangle\langle W^{\mu\nu}u_\mu\nabla_\nu\chi_-\rangle+\text{H.c.}$		829	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\sigma\chi_+f_{-\lambda\rho}\rangle+\text{H.c.}$		1899
$i\langle W^{\mu\nu}u_\mu u_\nu\chi_-^2\rangle+\text{H.c.}$	382	830	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda f_{-\rho}{}^\sigma u_\sigma\chi_+\rangle+\text{H.c.}$	758	1900
$i\langle W^{\mu\nu}u_\mu\chi_-u_\nu\chi_-\rangle+\text{H.c.}$	383	831	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{-\lambda\rho}u_\sigma\chi_+\rangle+\text{H.c.}$	759	1901
$i\langle W^{\mu\nu}u_\mu\chi_-^2u_\nu\rangle$	384	832	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{-\lambda\sigma}u_\rho\chi_+\rangle+\text{H.c.}$	760	1902
$i\langle W^{\mu\nu}\chi_-u_\mu u_\nu\chi_-\rangle$	385	833	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda f_{-\rho}{}^\sigma\chi_+u_\sigma\rangle+\text{H.c.}$	761	1903
$i\langle W^{\mu\nu}\rangle\langle u_\mu u_\nu\chi_-^2\rangle$		834	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{-\lambda\rho}\chi_+u_\sigma\rangle+\text{H.c.}$	762	1904
$i\langle\chi_-^2\rangle\langle W^{\mu\nu}u_\mu u_\nu\rangle$		835	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{-\lambda\sigma}\chi_+u_\rho\rangle+\text{H.c.}$	763	1905
$i\langle\chi_-\rangle\langle W^{\mu\nu}u_\mu u_\nu\chi_-\rangle+\text{H.c.}$		836	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\chi_+u^\sigma f_{-\rho\sigma}\rangle+\text{H.c.}$		1906
$i\langle u^\mu\chi_-\rangle\langle W_\mu{}^\nu u_\nu\chi_-\rangle+\text{H.c.}$		837	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\chi_+u_\lambda f_{-\rho\sigma}\rangle+\text{H.c.}$		1907
$i\langle\chi_-\rangle\langle W^{\mu\nu}u_\mu\chi_-u_\nu\rangle$		838	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\chi_+u_\sigma f_{-\lambda\rho}\rangle+\text{H.c.}$		1908
$i\langle W^{\mu\nu}\chi_-\rangle\langle u_\mu u_\nu\chi_-\rangle$		839	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{-\lambda\rho}u^\sigma u_\sigma\chi_+\rangle+\text{H.c.}$		1909
$i\langle W^{\mu\nu}\nabla_\mu\chi_-\nabla_\nu\chi_-\rangle$	386	840	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{-\lambda}{}^\sigma u_\rho u_\sigma\chi_+\rangle+\text{H.c.}$		1910
$\langle W^{\mu\nu}f_{+\mu\nu}\chi_-^2\rangle+\text{H.c.}$	387	841	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{-\lambda}{}^\sigma u_\sigma u_\rho\chi_+\rangle+\text{H.c.}$		1911
$\langle W^{\mu\nu}\chi_-f_{+\mu\nu}\chi_-\rangle$	388	842	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma h_{\rho\sigma}\chi_+\rangle+\text{H.c.}$	764	1912
$\langle W^{\mu\nu}\rangle\langle f_{+\mu\nu}\chi_-^2\rangle$	389	843	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda h_{\rho\sigma}\chi_+\rangle+\text{H.c.}$	765	1913
$\langle W^{\mu\nu}f_{+\mu\nu}\rangle\langle\chi_-^2\rangle$	390	844	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma\chi_+h_{\rho\sigma}\rangle+\text{H.c.}$	766	1914
$\langle\chi_-\rangle\langle W^{\mu\nu}f_{+\mu\nu}\chi_-\rangle+\text{H.c.}$	391	845	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda\chi_+h_{\rho\sigma}\rangle+\text{H.c.}$		1915
$\langle W^{\mu\nu}\chi_-\rangle\langle f_{+\mu\nu}\chi_-\rangle$	392	846	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda h_\rho{}^\sigma u_\sigma\chi_+\rangle+\text{H.c.}$	767	1916
$\langle f_+{}^{\mu\nu}\rangle\langle W_{\mu\nu}\chi_-^2\rangle$	393		$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma h_{\lambda\sigma}u_\rho\chi_+\rangle+\text{H.c.}$	768	1917
$\langle W^{\mu\nu}\rangle\langle\chi_-\rangle\langle f_{+\mu\nu}\chi_-\rangle$		847	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda h_\rho{}^\sigma\chi_+u_\sigma\rangle+\text{H.c.}$	769	1918
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u_\rho u^\sigma u^\delta f_{-\sigma\delta}\rangle+\text{H.c.}$	394	848	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma h_{\lambda\sigma}\chi_+u_\rho\rangle+\text{H.c.}$	770	1919
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma u_\rho u^\delta f_{-\sigma\delta}\rangle+\text{H.c.}$		849	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\chi_+u^\sigma h_{\rho\sigma}\rangle+\text{H.c.}$		1920
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma u_\sigma u^\delta f_{-\rho\delta}\rangle+\text{H.c.}$	395	850	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\chi_+u_\lambda h_{\rho\sigma}\rangle+\text{H.c.}$		1921
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma u^\delta u_\rho f_{-\sigma\delta}\rangle+\text{H.c.}$		851	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}h_\lambda{}^\sigma u_\rho u_\sigma\chi_+\rangle+\text{H.c.}$		1922

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma u^\delta u_\sigma f_{-\rho\delta}\rangle+\text{H.c.}$	396	852	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}h_\lambda{}^\sigma u_\sigma u_\rho\chi_+\rangle+\text{H.c.}$		1923
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma u^\delta u_\delta f_{-\rho\sigma}\rangle+\text{H.c.}$	397	853	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u_\rho u^\sigma\nabla_\sigma\chi_+\rangle+\text{H.c.}$	771	1924
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda u_\rho u^\delta f_{-\sigma\delta}\rangle+\text{H.c.}$		854	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma u_\rho\nabla_\sigma\chi_+\rangle+\text{H.c.}$	772	1925
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda u_\sigma u^\delta f_{-\rho\delta}\rangle+\text{H.c.}$	398	855	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda u_\rho\nabla_\sigma\chi_+\rangle+\text{H.c.}$		1926
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda u^\delta u_\rho f_{-\sigma\delta}\rangle+\text{H.c.}$		856	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u_\rho\nabla^\sigma\chi_+u_\sigma\rangle+\text{H.c.}$	773	1927
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda u^\delta u_\sigma f_{-\rho\delta}\rangle+\text{H.c.}$	399	857	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma\nabla_\sigma\chi_+u_\rho\rangle+\text{H.c.}$	774	1928
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda u^\delta u_\delta f_{-\rho\sigma}\rangle+\text{H.c.}$	400	858	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda\nabla_\sigma\chi_+u_\rho\rangle+\text{H.c.}$		1929
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\sigma u_\lambda u^\delta f_{-\rho\delta}\rangle+\text{H.c.}$	401	859	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u^\sigma f_{-\rho\sigma}\chi_+\rangle+\text{H.c.}$		1930
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\sigma u^\delta u_\lambda f_{-\rho\delta}\rangle+\text{H.c.}$	402	860	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\rangle\langle u^\sigma f_{-\rho\sigma}\chi_+\rangle+\text{H.c.}$		1931
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u^\delta u_\lambda u_\delta f_{-\rho\sigma}\rangle+\text{H.c.}$	403	861	$i\varepsilon^{\mu\nu\lambda\rho}\langle f_{-\mu}{}^\sigma\chi_+\rangle\langle W_{\nu\lambda}u_\rho u_\sigma\rangle+\text{H.c.}$		1932
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\sigma u^\delta u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$		862	$i\varepsilon^{\mu\nu\lambda\rho}\langle\chi_+\rangle\langle W_{\mu\nu}u_\lambda u^\sigma f_{-\rho\sigma}\rangle+\text{H.c.}$		1933
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u^\delta u_\sigma u_\lambda f_{-\rho\delta}\rangle+\text{H.c.}$	404	863	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u^\sigma u_\lambda f_{-\rho\sigma}\chi_+\rangle+\text{H.c.}$		1934
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u^\delta u_\lambda u_\rho f_{-\sigma\delta}\rangle+\text{H.c.}$		864	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\rangle\langle u_\lambda f_{-\rho\sigma}\chi_+\rangle+\text{H.c.}$		1935
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u^\delta u_\lambda u_\sigma f_{-\rho\delta}\rangle+\text{H.c.}$	405	865	$i\varepsilon^{\mu\nu\lambda\rho}\langle\chi_+\rangle\langle W_{\mu\nu}u^\sigma u_\lambda f_{-\rho\sigma}\rangle+\text{H.c.}$		1936
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u^\delta u_\sigma u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$		866	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u^\sigma u_\sigma f_{-\lambda\rho}\chi_+\rangle+\text{H.c.}$		1937
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u^\delta u_\delta u_\lambda f_{-\rho\sigma}\rangle+\text{H.c.}$	406	867	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\rangle\langle u_\sigma f_{-\lambda\rho}\chi_+\rangle+\text{H.c.}$		1938
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u^\delta u_\delta u_\sigma f_{-\lambda\rho}\rangle+\text{H.c.}$		868	$i\varepsilon^{\mu\nu\lambda\rho}\langle\chi_+\rangle\langle W_{\mu\nu}u^\sigma u_\sigma f_{-\lambda\rho}\rangle+\text{H.c.}$		1939
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\lambda u^\delta u_\rho f_{-\sigma\delta}\rangle+\text{H.c.}$		869	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda f_{-\rho}{}^\sigma u_\sigma\chi_+\rangle+\text{H.c.}$		1940
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u_\nu u_\lambda u^\delta f_{-\rho\delta}\rangle+\text{H.c.}$	407	870	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma\chi_+\rangle\langle W_{\mu\nu}u_\lambda f_{-\rho\sigma}\rangle+\text{H.c.}$		1941
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u_\nu u^\delta u_\lambda f_{-\rho\delta}\rangle+\text{H.c.}$	408	871	$i\varepsilon^{\mu\nu\lambda\rho}\langle\chi_+\rangle\langle W_{\mu\nu}u_\lambda f_{-\rho}{}^\sigma u_\sigma\rangle+\text{H.c.}$		1942
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u_\nu u^\delta u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$	409	872	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\chi_+\rangle\langle u_\lambda u^\sigma f_{-\rho\sigma}\rangle+\text{H.c.}$		1943
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u^\delta u_\nu u_\lambda f_{-\rho\delta}\rangle+\text{H.c.}$	410	873	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u^\sigma h_{\rho\sigma}\chi_+\rangle+\text{H.c.}$		1944
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\nu u_\sigma u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$	411	874	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\rangle\langle u^\sigma h_{\rho\sigma}\chi_+\rangle+\text{H.c.}$		1945
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\nu u_\delta u_\lambda f_{-\rho\sigma}\rangle+\text{H.c.}$		875	$i\varepsilon^{\mu\nu\lambda\rho}\langle h_\mu{}^\sigma\chi_+\rangle\langle W_{\nu\lambda}u_\rho u_\sigma\rangle+\text{H.c.}$		1946
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u^\delta u_\nu u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$	412	876	$i\varepsilon^{\mu\nu\lambda\rho}\langle\chi_+\rangle\langle W_{\mu\nu}u_\lambda u^\sigma h_{\rho\sigma}\rangle+\text{H.c.}$		1947
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u^\delta u_\delta u_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$	413	877	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u^\sigma u_\lambda h_{\rho\sigma}\chi_+\rangle+\text{H.c.}$		1948
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\sigma u_\lambda u^\delta f_{-\rho\delta}\rangle+\text{H.c.}$		878	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\rangle\langle u_\lambda h_{\rho\sigma}\chi_+\rangle+\text{H.c.}$		1949
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\sigma u^\delta u_\lambda f_{-\rho\delta}\rangle+\text{H.c.}$		879	$i\varepsilon^{\mu\nu\lambda\rho}\langle\chi_+\rangle\langle W_{\mu\nu}u^\sigma u_\lambda h_{\rho\sigma}\rangle+\text{H.c.}$		1950
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta u_\lambda u_\delta f_{-\rho\sigma}\rangle+\text{H.c.}$		880	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda h_\rho{}^\sigma u_\sigma\chi_+\rangle+\text{H.c.}$		1951
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\sigma u^\delta u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$	414	881	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma\chi_+\rangle\langle W_{\mu\nu}u_\lambda h_{\rho\sigma}\rangle+\text{H.c.}$		1952
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\lambda u^\delta u_\delta f_{-\rho\sigma}\rangle+\text{H.c.}$	415		$i\varepsilon^{\mu\nu\lambda\rho}\langle\chi_+\rangle\langle W_{\mu\nu}u_\lambda h_\rho{}^\sigma u_\sigma\rangle+\text{H.c.}$		1953
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta u_\sigma u_\lambda f_{-\rho\delta}\rangle+\text{H.c.}$		882	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\chi_+\rangle\langle u_\lambda u^\sigma h_{\rho\sigma}\rangle+\text{H.c.}$		1954
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\lambda u_\sigma u^\delta f_{-\rho\delta}\rangle+\text{H.c.}$		883	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u_\rho u^\sigma\nabla_\sigma\chi_+\rangle+\text{H.c.}$		1955
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta u_\sigma u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$	416	884	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\rangle\langle u_\rho u^\sigma\nabla_\sigma\chi_+\rangle+\text{H.c.}$		1956
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta u_\delta u_\lambda f_{-\rho\sigma}\rangle+\text{H.c.}$	417	885	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma\nabla_\sigma\chi_+\rangle\langle W_{\mu\nu}u_\lambda u_\rho\rangle$		1957
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta u_\lambda u_\sigma f_{-\rho\delta}\rangle+\text{H.c.}$		886	$i\varepsilon^{\mu\nu\lambda\rho}\langle\nabla^\sigma\chi_+\rangle\langle W_{\mu\nu}u_\lambda u_\rho u_\sigma\rangle+\text{H.c.}$		1958
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta u_\lambda u_\rho f_{-\sigma\delta}\rangle+\text{H.c.}$		887	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u^\sigma u_\rho\nabla_\sigma\chi_+\rangle$		1959

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta u_\delta u_\sigma f_{-\lambda\rho}\rangle+\text{H.c.}$	418	888	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu\nabla^\sigma\chi_+\rangle\langle W_{\nu\lambda}u_\rho u_\sigma\rangle+\text{H.c.}$		1960
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\sigma u_\nu u_\lambda f_{-\rho\delta}\rangle+\text{H.c.}$		889	$i\varepsilon^{\mu\nu\lambda\rho}\langle\nabla^\sigma\chi_+\rangle\langle W_{\mu\nu}u_\lambda u_\sigma u_\rho\rangle$		1961
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\sigma u_\nu u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$	419	890	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^\sigma\chi_+\rangle\langle u_\lambda u_\rho u_\sigma\rangle$		1962
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\sigma u_\delta u_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$	420	891	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla_\lambda f_{-\rho}{}^\sigma\nabla_\sigma\chi_+\rangle+\text{H.c.}$	775	1963
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\nu u_\lambda u_\delta f_{-\rho\sigma}\rangle+\text{H.c.}$	421		$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^\sigma f_{-\lambda\sigma}\nabla_\rho\chi_+\rangle+\text{H.c.}$	776	1964
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\nu u_\delta u_\sigma f_{-\lambda\rho}\rangle+\text{H.c.}$	422		$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma f_{-\rho\sigma}\chi_+\rangle+\text{H.c.}$	777	1965
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\nu u_\lambda u_\sigma f_{-\rho\delta}\rangle+\text{H.c.}$		892	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma\chi_+ f_{-\rho\sigma}\rangle+\text{H.c.}$	778	1966
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\nu u_\lambda u_\rho f_{-\sigma\delta}\rangle+\text{H.c.}$		893	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{-\lambda}{}^\sigma f_{+\rho\sigma}\chi_+\rangle+\text{H.c.}$	779	1967
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\delta u_\sigma u_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$	423	894	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma h_{\rho\sigma}\chi_+\rangle+\text{H.c.}$	780	1968
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\delta u_\nu u_\sigma f_{-\lambda\rho}\rangle+\text{H.c.}$	424	895	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma\chi_+ h_{\rho\sigma}\rangle+\text{H.c.}$	781	1969
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\delta u_\nu u_\lambda f_{-\rho\sigma}\rangle+\text{H.c.}$	425		$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}h_\lambda{}^\sigma f_{+\rho\sigma}\chi_+\rangle+\text{H.c.}$	782	1970
$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_\sigma u_\delta u_\mu u_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$	426	896	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla_\lambda f_{+\rho}{}^\sigma u_\sigma\chi_+\rangle+\text{H.c.}$	783	1971
$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_\sigma u_\mu u_\nu u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$		897	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^\sigma f_{+\lambda\sigma}u_\rho\chi_+\rangle+\text{H.c.}$	784	1972
$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_\mu u_\sigma u_\delta u_\nu f_{-\lambda\rho}\rangle+\text{H.c.}$		898	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla_\lambda f_{+\rho}{}^\sigma\chi_+ u_\sigma\rangle+\text{H.c.}$	785	1973
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u_\rho u^\sigma f_{-\sigma}{}^\delta u_\delta\rangle+\text{H.c.}$	427	899	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^\sigma f_{+\lambda\sigma}\chi_+ u_\rho\rangle+\text{H.c.}$	786	1974
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma u_\rho f_{-\sigma}{}^\delta u_\delta\rangle+\text{H.c.}$		900	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\nabla^\sigma f_{+\rho\sigma}\chi_+\rangle+\text{H.c.}$	787	1975
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma u_\sigma f_{-\rho}{}^\delta u_\delta\rangle+\text{H.c.}$	428	901	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\nabla_\lambda f_{+\rho\sigma}\chi_+\rangle+\text{H.c.}$	788	1976
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma u^\delta f_{-\rho\sigma}u_\delta\rangle+\text{H.c.}$	429	902	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda\rho}u^\sigma\nabla_\sigma\chi_+\rangle+\text{H.c.}$	789	1977
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma u^\delta f_{-\rho\delta}u_\sigma\rangle+\text{H.c.}$	430	903	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma u_\rho\nabla_\sigma\chi_+\rangle+\text{H.c.}$	790	1978
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma u^\delta f_{-\sigma\delta}u_\rho\rangle+\text{H.c.}$		904	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda f_{+\rho}{}^\sigma\nabla_\sigma\chi_+\rangle+\text{H.c.}$	791	1979
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda u_\rho f_{-\sigma}{}^\delta u_\delta\rangle+\text{H.c.}$	431	905	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{+\lambda\rho}\nabla_\sigma\chi_+\rangle+\text{H.c.}$	792	1980
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda u_\sigma f_{-\rho}{}^\delta u_\delta\rangle+\text{H.c.}$	432	906	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^\sigma f_{-\rho\sigma}\chi_+\rangle+\text{H.c.}$	793	1981
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda u^\delta f_{-\rho\sigma}u_\delta\rangle+\text{H.c.}$	433	907	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma\rangle\langle f_{-\rho\sigma}\chi_+\rangle$	794	1982
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda u^\delta f_{-\rho\delta}u_\sigma\rangle+\text{H.c.}$	434	908	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^\sigma\rangle\langle W_{\nu\lambda}f_{-\rho\sigma}\chi_+\rangle+\text{H.c.}$	795	
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda u^\delta f_{-\sigma\delta}u_\rho\rangle+\text{H.c.}$	435	909	$\varepsilon^{\mu\nu\lambda\rho}\langle\chi_+\rangle\langle W_{\mu\nu}f_{+\lambda}{}^\sigma f_{-\rho\sigma}\rangle+\text{H.c.}$		1983
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\sigma u_\lambda f_{-\rho}{}^\delta u_\delta\rangle+\text{H.c.}$	436	910	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{-\lambda}{}^\sigma\rangle\langle f_{+\rho\sigma}\chi_+\rangle$		1984
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\sigma u^\delta f_{-\lambda\rho}u_\delta\rangle+\text{H.c.}$		911	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\chi_+\rangle\langle f_{+\lambda}{}^\sigma f_{-\rho\sigma}\rangle$		1985
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u^\delta u_\lambda f_{-\rho\delta}u_\sigma\rangle+\text{H.c.}$	437	912	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^\sigma h_{\rho\sigma}\chi_+\rangle+\text{H.c.}$	796	1986
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u^\delta u_\lambda f_{-\sigma\delta}u_\rho\rangle+\text{H.c.}$		913	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma\rangle\langle h_{\rho\sigma}\chi_+\rangle$	797	1987
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\sigma u^\delta f_{-\lambda\delta}u_\rho\rangle+\text{H.c.}$	438	914	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^\sigma\rangle\langle W_{\nu\lambda}h_{\rho\sigma}\chi_+\rangle+\text{H.c.}$	798	
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u^\delta u_\lambda f_{-\rho\sigma}u_\delta\rangle+\text{H.c.}$	439	915	$\varepsilon^{\mu\nu\lambda\rho}\langle\chi_+\rangle\langle W_{\mu\nu}f_{+\lambda}{}^\sigma h_{\rho\sigma}\rangle+\text{H.c.}$		1988
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u^\delta u_\sigma f_{-\lambda\rho}u_\delta\rangle+\text{H.c.}$		916	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}h_\lambda{}^\sigma\rangle\langle f_{+\rho\sigma}\chi_+\rangle$		1989
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u^\delta u_\sigma f_{-\lambda\delta}u_\rho\rangle+\text{H.c.}$	440	917	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\chi_+\rangle\langle f_{+\lambda}{}^\sigma h_{\rho\sigma}\rangle$		1990
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u^\delta u_\delta f_{-\lambda\rho}u_\sigma\rangle+\text{H.c.}$		918	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle\nabla_\lambda f_{+\rho}{}^\sigma u_\sigma\chi_+\rangle+\text{H.c.}$	799	1991
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u^\delta u_\delta f_{-\lambda\sigma}u_\rho\rangle+\text{H.c.}$	441	919	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla_\lambda f_{+\rho}{}^\sigma\rangle\langle u_\sigma\chi_+\rangle$	800	1992
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u_\nu u_\lambda f_{-\rho}{}^\delta u_\delta\rangle+\text{H.c.}$		920	$\varepsilon^{\mu\nu\lambda\rho}\langle\chi_+\rangle\langle W_{\mu\nu}\nabla_\lambda f_{+\rho}{}^\sigma u_\sigma\rangle+\text{H.c.}$		1993
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u_\nu u^\delta f_{-\lambda\rho}u_\delta\rangle+\text{H.c.}$	442	921	$\varepsilon^{\mu\nu\lambda\rho}\langle\chi_+\rangle\langle W_{\mu\nu}\nabla^\sigma f_{+\lambda\sigma}u_\rho\rangle+\text{H.c.}$	801	1994

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u_\nu u^\delta f_{-\lambda\delta}u_\rho\rangle+\text{H.c.}$		922	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle\nabla^\sigma f_{+\lambda\sigma}u_\rho\chi_+\rangle+\text{H.c.}$	802	1995
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u^\delta u_\nu f_{-\lambda\rho}u_\delta\rangle+\text{H.c.}$	443	923	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla^\sigma f_{+\mu\sigma}\rangle\langle W_{\nu\lambda}u_\rho\chi_+\rangle+\text{H.c.}$	803	
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\nu u_\delta f_{-\lambda\rho}u_\sigma\rangle+\text{H.c.}$	444	924	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla_\mu f_{+\nu}{}^\sigma\rangle\langle W_{\lambda\rho}u_\sigma\chi_+\rangle+\text{H.c.}$	804	
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u^\delta u_\nu f_{-\lambda\delta}u_\rho\rangle+\text{H.c.}$		925	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^\sigma f_{+\lambda\sigma}\rangle\langle u_\rho\chi_+\rangle$		1996
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u^\delta u_\delta f_{-\nu\lambda}u_\rho\rangle+\text{H.c.}$	445	926	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\rangle\langle\nabla^\sigma f_{+\rho\sigma}\chi_+\rangle$		1997
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\sigma u_\lambda f_{-\rho}{}^\delta u_\delta\rangle+\text{H.c.}$		927	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\rangle\langle\nabla_\lambda f_{+\rho\sigma}\chi_+\rangle$		1998
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\sigma u^\delta f_{-\lambda\rho}u_\delta\rangle+\text{H.c.}$	446	928	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\chi_+\rangle\langle\nabla_\lambda f_{+\rho}{}^\sigma u_\sigma\rangle$		1999
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\lambda u^\delta f_{-\rho\sigma}u_\delta\rangle+\text{H.c.}$	447		$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\chi_+\rangle\langle\nabla^\sigma f_{+\lambda\sigma}u_\rho\rangle$		2000
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta u_\lambda f_{-\rho\delta}u_\sigma\rangle+\text{H.c.}$		929	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda\rho}u^\sigma\nabla_\sigma\chi_+\rangle+\text{H.c.}$	805	2001
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta u_\lambda f_{-\sigma\delta}u_\rho\rangle+\text{H.c.}$		930	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda\rho}\rangle\langle u^\sigma\nabla_\sigma\chi_+\rangle$	806	2002
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\sigma u^\delta f_{-\lambda\delta}u_\rho\rangle+\text{H.c.}$		931	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla^\sigma\chi_+\rangle\langle W_{\mu\nu}f_{+\lambda\rho}u_\sigma\rangle+\text{H.c.}$		2003
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\lambda u_\sigma f_{-\rho}{}^\delta u_\delta\rangle+\text{H.c.}$		932	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^\sigma u_\rho\nabla_\sigma\chi_+\rangle+\text{H.c.}$	807	2004
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\lambda u^\delta f_{-\sigma\delta}u_\rho\rangle+\text{H.c.}$		933	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma\rangle\langle u_\rho\nabla_\sigma\chi_+\rangle$	808	2005
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta u_\sigma f_{-\lambda\rho}u_\delta\rangle+\text{H.c.}$	448	934	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^\sigma\rangle\langle W_{\nu\lambda}u_\rho\nabla_\sigma\chi_+\rangle+\text{H.c.}$	809	
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta u_\delta f_{-\lambda\sigma}u_\rho\rangle+\text{H.c.}$	449	935	$\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu}\rangle\langle W_{\lambda\rho}u^\sigma\nabla_\sigma\chi_+\rangle+\text{H.c.}$	810	
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta u_\delta f_{-\lambda\rho}u_\sigma\rangle+\text{H.c.}$	450	936	$\varepsilon^{\mu\nu\lambda\rho}\langle\nabla^\sigma\chi_+\rangle\langle W_{\mu\nu}f_{+\lambda\sigma}u_\rho\rangle+\text{H.c.}$		2006
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\sigma u_\nu f_{-\lambda\rho}u_\delta\rangle+\text{H.c.}$	451	937	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\rangle\langle f_{+\rho}{}^\sigma\nabla_\sigma\chi_+\rangle$		2007
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\sigma u_\nu f_{-\lambda\delta}u_\rho\rangle+\text{H.c.}$		938	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\rangle\langle f_{+\lambda\rho}\nabla_\sigma\chi_+\rangle$		2008
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\sigma u_\delta f_{-\nu\lambda}u_\rho\rangle+\text{H.c.}$	452	939	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^\sigma\chi_+\rangle\langle f_{+\lambda\rho}u_\sigma\rangle$		2009
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\nu u_\sigma f_{-\lambda\rho}u_\delta\rangle+\text{H.c.}$	453	940	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\nabla^\sigma\chi_+\rangle\langle f_{+\lambda\sigma}u_\rho\rangle$		2010
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\nu u_\lambda f_{-\rho\sigma}u_\delta\rangle+\text{H.c.}$	454		$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{-\lambda\rho}\chi_+^2\rangle+\text{H.c.}$	811	2011
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\nu u_\delta f_{-\lambda\sigma}u_\rho\rangle+\text{H.c.}$	455		$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\chi_+\nabla_\rho\chi_+\rangle+\text{H.c.}$	812	2012
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\nu u_\lambda f_{-\sigma\delta}u_\rho\rangle+\text{H.c.}$		941	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\chi_+u_\lambda\nabla_\rho\chi_+\rangle+\text{H.c.}$	813	2013
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\delta u_\sigma f_{-\nu\lambda}u_\rho\rangle+\text{H.c.}$	456	942	$i\varepsilon^{\mu\nu\lambda\rho}\langle\chi_+\rangle\langle W_{\mu\nu}f_{-\lambda\rho}\chi_+\rangle+\text{H.c.}$		2014
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\delta u_\nu f_{-\lambda\rho}u_\sigma\rangle+\text{H.c.}$	457	943	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda\chi_+\nabla_\rho\chi_+\rangle+\text{H.c.}$		2015
$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_\mu u_\sigma u_\delta f_{-\nu\lambda}u_\rho\rangle+\text{H.c.}$		944	$i\varepsilon^{\mu\nu\lambda\rho}\langle\nabla_\mu\chi_+\rangle\langle W_{\nu\lambda}u_\rho\chi_+\rangle+\text{H.c.}$		2016
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u_\rho f_-{}^{\sigma\delta}u_\sigma u_\delta\rangle+\text{H.c.}$		945	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u_\rho u^\sigma u_\sigma\chi_-\rangle+\text{H.c.}$	814	2017
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma f_{-\rho\sigma}u^\delta u_\delta\rangle+\text{H.c.}$	458	946	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma u_\rho u_\sigma\chi_-\rangle+\text{H.c.}$	815	2018
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma f_{-\rho}{}^\delta u_\sigma u_\delta\rangle+\text{H.c.}$	459	947	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma u_\sigma u_\rho\chi_-\rangle+\text{H.c.}$		2019
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma f_{-\rho}{}^\delta u_\delta u_\sigma\rangle+\text{H.c.}$	460	948	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda u_\rho u_\sigma\chi_-\rangle+\text{H.c.}$		2020
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma f_{-\sigma}{}^\delta u_\rho u_\delta\rangle+\text{H.c.}$		949	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda u_\sigma u_\rho\chi_-\rangle+\text{H.c.}$		2021
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda f_{-\rho\sigma}u^\delta u_\delta\rangle+\text{H.c.}$	461	950	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\sigma u_\lambda u_\rho\chi_-\rangle+\text{H.c.}$		2022
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda f_{-\rho}{}^\delta u_\sigma u_\delta\rangle+\text{H.c.}$	462	951	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u_\nu u_\lambda u_\rho\chi_-\rangle+\text{H.c.}$		2023
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda f_{-\rho}{}^\delta u_\delta u_\sigma\rangle+\text{H.c.}$	463	952	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\sigma u_\lambda u_\rho\chi_-\rangle+\text{H.c.}$		2024
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u_\nu f_{-\lambda\rho}u^\delta u_\delta\rangle+\text{H.c.}$	464	953	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\lambda u_\sigma u_\rho\chi_-\rangle+\text{H.c.}$		2025
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u_\nu f_{-\lambda}{}^\delta u_\rho u_\delta\rangle+\text{H.c.}$		954	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\lambda u_\rho u_\sigma\chi_-\rangle+\text{H.c.}$		2026
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u_\nu f_{-\lambda}{}^\delta u_\delta u_\rho\rangle+\text{H.c.}$		955	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u_\rho u^\sigma\chi_-u_\sigma\rangle+\text{H.c.}$	816	2027

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u^\delta f_{-\nu\lambda} u_\rho u_\delta\rangle + \text{H.c.}$	465	956	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma u_\rho \chi_- u_\sigma\rangle + \text{H.c.}$		2028
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u^\delta f_{-\nu\lambda} u_\delta u_\rho\rangle + \text{H.c.}$	466	957	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma u_\sigma \chi_- u_\rho\rangle + \text{H.c.}$	817	2029
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\nu f_{-\sigma\delta} u_\lambda u_\rho\rangle + \text{H.c.}$		958	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u_\lambda u_\rho \chi_- u_\sigma\rangle + \text{H.c.}$	818	2030
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u^\delta f_{-\nu\delta} u_\lambda u_\rho\rangle + \text{H.c.}$		959	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u_\lambda u_\sigma \chi_- u_\rho\rangle + \text{H.c.}$	819	2031
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\sigma f_{-\lambda\rho} u^\delta u_\delta\rangle + \text{H.c.}$	467	960	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u_\sigma u_\lambda \chi_- u_\rho\rangle + \text{H.c.}$		2032
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\lambda f_{-\rho\sigma} u^\delta u_\delta\rangle + \text{H.c.}$	468		$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u_\nu u_\lambda \chi_- u_\rho\rangle + \text{H.c.}$	820	2033
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta f_{-\lambda\sigma} u_\rho u_\delta\rangle + \text{H.c.}$	469		$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\sigma u_\lambda \chi_- u_\rho\rangle + \text{H.c.}$		2034
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\sigma f_{-\lambda}{}^\delta u_\rho u_\delta\rangle + \text{H.c.}$		961	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\lambda u_\sigma \chi_- u_\rho\rangle + \text{H.c.}$		2035
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\sigma f_{-\lambda}{}^\delta u_\delta u_\rho\rangle + \text{H.c.}$		962	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u_\rho \chi_- u^\sigma u_\sigma\rangle + \text{H.c.}$		2036
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\lambda f_{-\sigma}{}^\delta u_\delta u_\rho\rangle + \text{H.c.}$		963	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma \chi_- u_\rho u_\sigma\rangle + \text{H.c.}$		2037
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta f_{-\lambda\rho} u_\sigma u_\delta\rangle + \text{H.c.}$	470	964	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma \chi_- u_\sigma u_\rho\rangle$		2038
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\sigma f_{-\nu\lambda} u_\rho u_\delta\rangle + \text{H.c.}$	471		$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u_\lambda \chi_- u_\rho u_\sigma\rangle$		2039
$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta} u_\sigma u_\delta f_{-\mu\nu} u_\lambda u_\rho\rangle + \text{H.c.}$		965	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u_\nu \chi_- u_\lambda u_\rho\rangle + \text{H.c.}$		2040
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u_\rho u^\sigma u^\delta h_{\sigma\delta}\rangle + \text{H.c.}$	472	966	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\sigma \chi_- u_\lambda u_\rho\rangle + \text{H.c.}$		2041
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma u_\rho u^\delta h_{\sigma\delta}\rangle + \text{H.c.}$	473	967	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u_\rho u^\sigma u_\sigma \chi_-\rangle + \text{H.c.}$		2042
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma u_\sigma u^\delta h_{\rho\delta}\rangle + \text{H.c.}$	474	968	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda\rangle\langle u_\rho u^\sigma u_\sigma \chi_-\rangle + \text{H.c.}$		2043
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma u^\delta u_\rho h_{\sigma\delta}\rangle + \text{H.c.}$		969	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u_\rho\rangle\langle u^\sigma u_\sigma \chi_-\rangle$		2044
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma u^\delta u_\sigma h_{\rho\delta}\rangle + \text{H.c.}$	475	970	$\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma \chi_-\rangle\langle W_{\mu\nu} u_\lambda u_\rho u_\sigma\rangle + \text{H.c.}$	821	2045
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma u^\delta u_\delta h_{\rho\sigma}\rangle + \text{H.c.}$		971	$\varepsilon^{\mu\nu\lambda\rho}\langle \chi_-\rangle\langle W_{\mu\nu} u_\lambda u_\rho u^\sigma u_\sigma\rangle + \text{H.c.}$		2046
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u_\lambda u_\rho u^\delta h_{\sigma\delta}\rangle + \text{H.c.}$		972	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u^\sigma u_\rho u_\sigma \chi_-\rangle + \text{H.c.}$		2047
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u_\lambda u_\sigma u^\delta h_{\rho\delta}\rangle + \text{H.c.}$	476	973	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma\rangle\langle u_\rho u_\sigma \chi_-\rangle + \text{H.c.}$	822	2048
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u_\lambda u^\delta u_\rho h_{\sigma\delta}\rangle + \text{H.c.}$		974	$\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma \chi_-\rangle\langle W_{\mu\nu} u_\lambda u_\sigma u_\rho\rangle$		2049
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u_\lambda u^\delta u_\sigma h_{\rho\delta}\rangle + \text{H.c.}$		975	$\varepsilon^{\mu\nu\lambda\rho}\langle \chi_-\rangle\langle W_{\mu\nu} u_\lambda u^\sigma u_\rho u_\sigma\rangle + \text{H.c.}$		2050
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u_\lambda u^\delta u_\delta h_{\rho\sigma}\rangle + \text{H.c.}$		976	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u^\sigma u_\sigma u_\rho \chi_-\rangle$		2051
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u_\sigma u_\lambda u^\delta h_{\rho\delta}\rangle + \text{H.c.}$	477	977	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma\rangle\langle u_\sigma u_\rho \chi_-\rangle + \text{H.c.}$		2052
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u_\sigma u^\delta u_\lambda h_{\rho\delta}\rangle + \text{H.c.}$		978	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu \chi_-\rangle\langle W_{\nu\lambda} u_\rho u^\sigma u_\sigma\rangle + \text{H.c.}$		2053
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u^\delta u_\lambda u_\delta h_{\rho\sigma}\rangle + \text{H.c.}$	478	979	$\varepsilon^{\mu\nu\lambda\rho}\langle \chi_-\rangle\langle W_{\mu\nu} u_\lambda u^\sigma u_\sigma u_\rho\rangle$		2054
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\delta u_\nu u_\lambda h_{\rho\sigma}\rangle + \text{H.c.}$	479		$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u^\sigma u_\lambda u_\rho u_\sigma \chi_-\rangle$		2055
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u^\delta u_\lambda u_\rho h_{\sigma\delta}\rangle + \text{H.c.}$		980	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma\rangle\langle u_\lambda u_\rho u_\sigma \chi_-\rangle + \text{H.c.}$	823	2056
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u^\delta u_\lambda u_\sigma h_{\rho\delta}\rangle + \text{H.c.}$		981	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma\rangle\langle u_\sigma u_\nu u_\lambda u_\rho \chi_-\rangle + \text{H.c.}$	824	
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u^\delta u_\sigma u_\lambda h_{\rho\delta}\rangle + \text{H.c.}$		982	$\varepsilon^{\mu\nu\lambda\rho}\langle \chi_-\rangle\langle W_{\mu\nu} u^\sigma u_\lambda u_\rho u_\sigma\rangle$		2057
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u^\delta u_\delta u_\lambda h_{\rho\sigma}\rangle + \text{H.c.}$		983	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma\rangle\langle u_\lambda u_\sigma u_\rho \chi_-\rangle$		2058
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u_\nu u_\lambda u^\delta h_{\rho\delta}\rangle + \text{H.c.}$		984	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u_\sigma\rangle\langle u_\lambda u_\rho \chi_-\rangle$		2059
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u_\nu u^\delta u_\lambda h_{\rho\delta}\rangle + \text{H.c.}$		985	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma\rangle\langle u_\nu u_\lambda u_\rho \chi_-\rangle$		2060
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u^\delta u_\nu u_\lambda h_{\rho\delta}\rangle + \text{H.c.}$		986	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u_\nu\rangle\langle u_\lambda u_\rho \chi_-\rangle + \text{H.c.}$		2061
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\sigma u_\lambda u^\delta h_{\rho\delta}\rangle + \text{H.c.}$		987	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu \chi_-\rangle\langle W_\nu{}^\sigma u_\sigma u_\lambda u_\rho\rangle + \text{H.c.}$		2062
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\sigma u^\delta u_\lambda h_{\rho\delta}\rangle + \text{H.c.}$		988	$\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu\rangle\langle u_\sigma u_\lambda u_\rho \chi_-\rangle + \text{H.c.}$		2063

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Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u_\nu u^\delta u_\lambda u_\delta h_{\rho\sigma}\rangle + \text{H.c.}$		989	$\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u_\nu u_\lambda\rangle\langle u_\sigma u_\rho \chi_-\rangle + \text{H.c.}$		2064
$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u_\nu u_\lambda u_\sigma u^\delta h_{\rho\delta}\rangle + \text{H.c.}$		990	$\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u_\sigma\rangle\langle W_{\mu\nu} u_\lambda u_\rho \chi_-\rangle + \text{H.c.}$		2065
$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u_\nu u_\lambda u^\delta u_\sigma h_{\rho\delta}\rangle + \text{H.c.}$		991	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda} u_\rho u_\sigma \chi_-\rangle + \text{H.c.}$		2066
$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u_\nu u_\lambda u^\delta u_\delta h_{\rho\sigma}\rangle + \text{H.c.}$		992	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda} u_\sigma u_\rho \chi_-\rangle + \text{H.c.}$		2067
$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u_\nu u^\delta u_\sigma u_\lambda h_{\rho\delta}\rangle + \text{H.c.}$		993	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda \chi_-\rangle\langle u_\rho u^\sigma u_\sigma\rangle + \text{H.c.}$		2068
$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u_\nu u^\delta u_\lambda u_\sigma h_{\rho\delta}\rangle + \text{H.c.}$		994	$\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u_\sigma\rangle\langle W_{\mu\nu} u_\lambda \chi_- u_\rho\rangle$		2069
$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u_\nu u^\delta u_\delta u_\lambda h_{\rho\sigma}\rangle + \text{H.c.}$		995	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda} u_\rho \chi_- u_\sigma\rangle + \text{H.c.}$	825	2070
$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u^\delta u_\sigma u_\nu u_\lambda h_{\rho\delta}\rangle + \text{H.c.}$		996	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} {f_{-\lambda}}^\sigma f_{-\rho\sigma}\chi_-\rangle + \text{H.c.}$	826	
$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u^\delta u_\nu u_\sigma u_\lambda h_{\rho\delta}\rangle + \text{H.c.}$		997	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda {f_{-\rho}}^\sigma \nabla_\sigma \chi_-\rangle + \text{H.c.}$	827	
$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u^\delta u_\nu u_\lambda u_\sigma h_{\rho\delta}\rangle + \text{H.c.}$		998	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma \chi_-\rangle\langle u_\lambda u_\rho u_\sigma\rangle + \text{H.c.}$		2071
$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u^\delta u_\nu u_\lambda u_\delta h_{\rho\sigma}\rangle + \text{H.c.}$		999	$\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u_\sigma \chi_-\rangle\langle u_\nu u_\lambda u_\rho\rangle + \text{H.c.}$		2072
$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u^\delta u_\nu u_\delta u_\lambda h_{\rho\sigma}\rangle + \text{H.c.}$		1000	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u^\sigma\rangle\langle u_\rho u_\sigma \chi_-\rangle + \text{H.c.}$		2073
$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta} u_\mu u_\nu u_\sigma u_\lambda h_{\rho\delta}\rangle + \text{H.c.}$		1001	$\varepsilon^{\mu\nu\lambda\rho}\langle \chi_-\rangle\langle {W_\mu}^\sigma u_\sigma\rangle\langle u_\nu u_\lambda u_\rho\rangle$		2074
$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta} u_\mu u_\nu u_\lambda u_\sigma h_{\rho\delta}\rangle + \text{H.c.}$		1002	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} f_{+\lambda\rho} u^\sigma u_\sigma \chi_-\rangle + \text{H.c.}$	828	2075
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u_\rho u^\sigma {h_\sigma}^\delta u_\delta\rangle + \text{H.c.}$	480	1003	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} {f_{+\lambda}}^\sigma u_\rho u_\sigma \chi_-\rangle + \text{H.c.}$	829	2076
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma u_\rho {h_\sigma}^\delta u_\delta\rangle + \text{H.c.}$		1004	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} {f_{+\lambda}}^\sigma u_\sigma u_\rho \chi_-\rangle + \text{H.c.}$	830	2077
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma u_\sigma {h_\rho}^\delta u_\delta\rangle + \text{H.c.}$		1005	$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma f_{+\nu\sigma} u_\lambda u_\rho \chi_-\rangle + \text{H.c.}$		2078
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma u^\delta h_{\rho\sigma} u_\delta\rangle + \text{H.c.}$		1006	$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma f_{+\nu\lambda} u_\sigma u_\rho \chi_-\rangle + \text{H.c.}$		2079
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma u^\delta h_{\rho\delta} u_\sigma\rangle + \text{H.c.}$		1007	$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma f_{+\nu\lambda} u_\rho u_\sigma \chi_-\rangle + \text{H.c.}$		2080
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda u^\sigma u^\delta h_{\sigma\delta} u_\rho\rangle + \text{H.c.}$		1008	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} f_{+\lambda\rho} u^\sigma \chi_- u_\sigma\rangle + \text{H.c.}$	831	2081
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u_\lambda u_\rho {h_\sigma}^\delta u_\delta\rangle + \text{H.c.}$	481	1009	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} {f_{+\lambda}}^\sigma u_\rho \chi_- u_\sigma\rangle + \text{H.c.}$	832	2082
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u_\lambda u_\sigma {h_\rho}^\delta u_\delta\rangle + \text{H.c.}$	482	1010	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} {f_{+\lambda}}^\sigma u_\sigma \chi_- u_\rho\rangle + \text{H.c.}$	833	2083
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u_\lambda u^\delta h_{\rho\sigma} u_\delta\rangle + \text{H.c.}$	483	1011	$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma f_{+\nu\sigma} u_\lambda \chi_- u_\rho\rangle + \text{H.c.}$	834	2084
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u_\lambda u^\delta h_{\rho\delta} u_\sigma\rangle + \text{H.c.}$	484	1012	$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma f_{+\nu\lambda} u_\sigma \chi_- u_\rho\rangle + \text{H.c.}$	835	2085
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u_\lambda u^\delta h_{\sigma\delta} u_\rho\rangle + \text{H.c.}$	485	1013	$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma f_{+\nu\lambda} u_\rho \chi_- u_\sigma\rangle + \text{H.c.}$	836	2086
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u_\sigma u_\lambda {h_\rho}^\delta u_\delta\rangle + \text{H.c.}$		1014	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} f_{+\lambda\rho} \chi_- u^\sigma u_\sigma\rangle + \text{H.c.}$		2087
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u_\sigma u^\delta h_{\lambda\delta} u_\rho\rangle + \text{H.c.}$		1015	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} {f_{+\lambda}}^\sigma \chi_- u_\rho u_\sigma\rangle + \text{H.c.}$		2088
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u^\delta u_\lambda h_{\rho\sigma} u_\delta\rangle + \text{H.c.}$		1016	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} {f_{+\lambda}}^\sigma \chi_- u_\sigma u_\rho\rangle + \text{H.c.}$		2089
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u^\delta u_\lambda h_{\rho\delta} u_\sigma\rangle + \text{H.c.}$		1017	$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma f_{+\nu\sigma} \chi_- u_\lambda u_\rho\rangle + \text{H.c.}$		2090
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u^\delta u_\lambda h_{\sigma\delta} u_\rho\rangle + \text{H.c.}$		1018	$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma f_{+\nu\lambda} \chi_- u_\sigma u_\rho\rangle + \text{H.c.}$		2091
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u^\delta u_\sigma h_{\lambda\delta} u_\rho\rangle + \text{H.c.}$		1019	$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma f_{+\nu\lambda} \chi_- u_\rho u_\sigma\rangle + \text{H.c.}$		2092
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma u^\delta u_\delta h_{\lambda\sigma} u_\rho\rangle + \text{H.c.}$		1020	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u_\lambda {f_{+\rho}}^\sigma u_\sigma \chi_-\rangle + \text{H.c.}$	837	2093
$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u_\sigma u_\nu u_\lambda {h_\rho}^\delta u_\delta\rangle + \text{H.c.}$		1021	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma f_{+\lambda\rho} u_\sigma \chi_-\rangle + \text{H.c.}$	838	2094
$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u_\sigma u_\nu u^\delta h_{\lambda\delta} u_\rho\rangle + \text{H.c.}$		1022	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu} u^\sigma f_{+\lambda\sigma} u_\rho \chi_-\rangle + \text{H.c.}$	839	2095
$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u_\sigma u^\delta u_\nu h_{\lambda\delta} u_\rho\rangle + \text{H.c.}$		1023	$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u_\sigma f_{+\nu\lambda} u_\rho \chi_-\rangle + \text{H.c.}$		2096
$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u_\nu u_\sigma u_\lambda {h_\rho}^\delta u_\delta\rangle + \text{H.c.}$		1024	$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u_\nu f_{+\lambda\sigma} u_\rho \chi_-\rangle + \text{H.c.}$		2097
$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u_\nu u_\sigma u^\delta h_{\lambda\delta} u_\rho\rangle + \text{H.c.}$		1025	$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u_\nu f_{+\lambda\rho} u_\sigma \chi_-\rangle + \text{H.c.}$		2098

Continued on next page

Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\lambda u_\sigma h_\rho{}^\delta u_\delta\rangle+\text{H.c.}$		1026	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda f_{+\rho}{}^\sigma\chi_{-}u_\sigma\rangle+\text{H.c.}$	840	2099
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\lambda u_\rho h_\sigma{}^\delta u_\delta\rangle+\text{H.c.}$		1027	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{+\lambda\rho}\chi_{-}u_\sigma\rangle+\text{H.c.}$	841	2100
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\lambda u^\delta h_{\rho\sigma}u_\delta\rangle+\text{H.c.}$		1028	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma f_{+\lambda\sigma}\chi_{-}u_\rho\rangle+\text{H.c.}$	842	2101
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\lambda u^\delta h_{\sigma\delta}u_\rho\rangle+\text{H.c.}$		1029	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma f_{+\nu\lambda}\chi_{-}u_\rho\rangle+\text{H.c.}$	843	2102
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta u_\sigma h_{\lambda\delta}u_\rho\rangle+\text{H.c.}$		1030	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu f_{+\lambda\sigma}\chi_{-}u_\rho\rangle+\text{H.c.}$		2103
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta u_\lambda h_{\rho\sigma}u_\delta\rangle+\text{H.c.}$		1031	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu f_{+\lambda\rho}\chi_{-}u_\sigma\rangle+\text{H.c.}$	844	2104
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta u_\lambda h_{\sigma\delta}u_\rho\rangle+\text{H.c.}$		1032	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma f_{+\rho\sigma}\chi_{-}\rangle+\text{H.c.}$		2105
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta u_\delta h_{\lambda\sigma}u_\rho\rangle+\text{H.c.}$		1033	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda f_{+\rho\sigma}\chi_{-}\rangle+\text{H.c.}$		2106
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\sigma u_\nu h_{\lambda\delta}u_\rho\rangle+\text{H.c.}$		1034	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\sigma f_{+\lambda\rho}\chi_{-}\rangle+\text{H.c.}$		2107
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\nu u_\sigma h_{\lambda\delta}u_\rho\rangle+\text{H.c.}$		1035	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u_\nu f_{+\lambda\rho}\chi_{-}\rangle+\text{H.c.}$		2108
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u^\delta u_\nu u_\lambda h_{\rho\sigma}u_\delta\rangle+\text{H.c.}$		1036	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\sigma f_{+\lambda\rho}\chi_{-}\rangle+\text{H.c.}$		2109
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u_\rho h^{\sigma\delta}u_\sigma u_\delta\rangle+\text{H.c.}$		1037	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda\rho}u^\sigma u_\sigma\chi_{-}\rangle+\text{H.c.}$	845	2110
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma h_{\rho\sigma}u^\delta u_\delta\rangle+\text{H.c.}$		1038	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda\rho}\rangle\langle u^\sigma u_\sigma\chi_{-}\rangle$	846	2111
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma h_\rho{}^\delta u_\sigma u_\delta\rangle+\text{H.c.}$		1039	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma\chi_{-}\rangle\langle W_{\mu\nu}f_{+\lambda\rho}u_\sigma\rangle+\text{H.c.}$	847	2112
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma h_\rho{}^\delta u_\delta u_\sigma\rangle+\text{H.c.}$		1040	$i\varepsilon^{\mu\nu\lambda\rho}\langle\chi_{-}\rangle\langle W_{\mu\nu}f_{+\lambda\rho}u^\sigma u_\sigma\rangle+\text{H.c.}$	848	2113
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma h_\sigma{}^\delta u_\rho u_\delta\rangle+\text{H.c.}$		1041	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^\sigma u_\rho u_\sigma\chi_{-}\rangle+\text{H.c.}$	849	2114
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma h_\sigma{}^\delta u_\delta u_\rho\rangle$		1042	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma\rangle\langle u_\rho u_\sigma\chi_{-}\rangle+\text{H.c.}$	850	2115
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda h_{\rho\sigma}u^\delta u_\delta\rangle+\text{H.c.}$		1043	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma\chi_{-}\rangle\langle W_{\mu\nu}f_{+\lambda\sigma}u_\rho\rangle+\text{H.c.}$	851	2116
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda h_\rho{}^\delta u_\sigma u_\delta\rangle+\text{H.c.}$		1044	$i\varepsilon^{\mu\nu\lambda\rho}\langle\chi_{-}\rangle\langle W_{\mu\nu}f_{+\lambda}{}^\sigma u_\rho u_\sigma\rangle+\text{H.c.}$		2117
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda h_\rho{}^\delta u_\delta u_\sigma\rangle+\text{H.c.}$		1045	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^\sigma u_\sigma u_\rho\chi_{-}\rangle+\text{H.c.}$		2118
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\lambda h_\sigma{}^\delta u_\rho u_\delta\rangle$		1046	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu\chi_{-}\rangle\langle W_{\nu\lambda}f_{+\rho}{}^\sigma u_\sigma\rangle+\text{H.c.}$	852	2119
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u_\nu h_\lambda{}^\delta u_\rho u_\delta\rangle+\text{H.c.}$		1047	$i\varepsilon^{\mu\nu\lambda\rho}\langle\chi_{-}\rangle\langle W_{\mu\nu}f_{+\lambda}{}^\sigma u_\sigma u_\rho\rangle+\text{H.c.}$		2120
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u_\nu h_\lambda{}^\delta u_\delta u_\rho\rangle+\text{H.c.}$		1048	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda\rho}u^\sigma\chi_{-}u_\sigma\rangle$	853	2121
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u^\delta h_{\nu\delta}u_\lambda u_\rho\rangle+\text{H.c.}$		1049	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^\sigma u_\rho\chi_{-}u_\sigma\rangle+\text{H.c.}$	854	2122
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\sigma h_\lambda{}^\delta u_\rho u_\delta\rangle+\text{H.c.}$		1050	$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma u_\sigma\rangle\langle W_{\mu\nu}f_{+\lambda\rho}\chi_{-}\rangle+\text{H.c.}$		2123
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\sigma h_\lambda{}^\delta u_\delta u_\rho\rangle+\text{H.c.}$		1051	$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu u^\sigma\rangle\langle W_{\nu\lambda}f_{+\rho\sigma}\chi_{-}\rangle+\text{H.c.}$		2124
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\lambda h_{\rho\sigma}u^\delta u_\delta\rangle+\text{H.c.}$		1052	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\rangle\langle f_{+\rho}{}^\sigma u_\sigma\chi_{-}\rangle+\text{H.c.}$	855	2125
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\lambda h_\sigma{}^\delta u_\rho u_\delta\rangle+\text{H.c.}$		1053	$i\varepsilon^{\mu\nu\lambda\rho}\langle\chi_{-}\rangle\langle W_{\mu\nu}u_\lambda f_{+\rho}{}^\sigma u_\sigma\rangle+\text{H.c.}$		2126
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\lambda h_\rho{}^\delta u_\sigma u_\delta\rangle+\text{H.c.}$		1054	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\rangle\langle f_{+\lambda\rho}u_\sigma\chi_{-}\rangle+\text{H.c.}$	856	2127
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u^\delta h_{\lambda\sigma}u_\rho u_\delta\rangle+\text{H.c.}$		1055	$i\varepsilon^{\mu\nu\lambda\rho}\langle\chi_{-}\rangle\langle W_{\mu\nu}u^\sigma f_{+\lambda\rho}u_\sigma\rangle$		2128
$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_\sigma u_\mu h_{\nu\delta}u_\lambda u_\rho\rangle+\text{H.c.}$		1056	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\rangle\langle f_{+\lambda\sigma}u_\rho\chi_{-}\rangle+\text{H.c.}$	857	2129
$i\varepsilon^{\mu\nu\lambda\rho}\langle W^{\sigma\delta}u_\mu u_\sigma h_{\nu\delta}u_\lambda u_\rho\rangle+\text{H.c.}$		1057	$i\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^\sigma\rangle\langle W_{\nu\lambda}u_\rho u_\sigma\chi_{-}\rangle+\text{H.c.}$	858	
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u_\rho u^\sigma u^\delta f_{-\sigma\delta}\rangle+\text{H.c.}$		1058	$i\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu}\rangle\langle W_{\lambda\rho}u^\sigma u_\sigma\chi_{-}\rangle+\text{H.c.}$	859	
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\rangle\langle u_\rho u^\sigma u^\delta f_{-\sigma\delta}\rangle+\text{H.c.}$		1059	$i\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^\sigma\chi_{-}\rangle\langle W_{\nu\lambda}u_\rho u_\sigma\rangle+\text{H.c.}$		2130
$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma f_{-\sigma}{}^\delta\rangle\langle W_{\mu\nu}u_\lambda u_\rho u_\delta\rangle+\text{H.c.}$	486	1060	$i\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu}\chi_{-}\rangle\langle W_{\lambda\rho}u^\sigma u_\sigma\rangle$		2131
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u^\sigma u_\rho u^\delta f_{-\sigma\delta}\rangle+\text{H.c.}$		1061	$i\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^\sigma u_\sigma\rangle\langle W_{\nu\lambda}u_\rho\chi_{-}\rangle+\text{H.c.}$		2132
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\rangle\langle u^\sigma u_\rho u^\delta f_{-\sigma\delta}\rangle$	487	1062	$i\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu}u^\sigma\rangle\langle W_{\lambda\rho}u_\sigma\chi_{-}\rangle+\text{H.c.}$	860	2133

Continued on next page

Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma\rangle\langle u_\rho u^\delta f_{-\sigma\delta}\rangle+\text{H.c.}$		1063	$i\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^\sigma\rangle\langle W_{\nu\lambda}u_\rho\chi_- u_\sigma\rangle+\text{H.c.}$	861	
$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma f_{-\sigma}{}^\delta\rangle\langle W_{\mu\nu}u_\lambda u_\delta u_\rho\rangle$		1064	$i\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu}\rangle\langle W_{\lambda\rho}u^\sigma\chi_- u_\sigma\rangle$	862	
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u^\sigma u_\sigma u^\delta f_{-\rho\delta}\rangle+\text{H.c.}$	488	1065	$i\varepsilon^{\mu\nu\lambda\rho}\langle\chi_-\rangle\langle W_{\mu\nu}u^\sigma\rangle\langle f_{+\lambda\rho}u_\sigma\rangle$	863	
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\rangle\langle u^\sigma u_\sigma u^\delta f_{-\rho\delta}\rangle+\text{H.c.}$		1066	$i\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu}{}^\sigma u_\nu\rangle\langle W_{\lambda\rho}u_\sigma\chi_-\rangle+\text{H.c.}$		2134
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma\rangle\langle u_\sigma u^\delta f_{-\rho\delta}\rangle+\text{H.c.}$	489	1067	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\chi_-\rangle\langle f_{+\lambda\rho}u^\sigma u_\sigma\rangle$		2135
$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma f_{-\mu\sigma}\rangle\langle W_{\nu\lambda}u_\rho u^\delta u_\delta\rangle+\text{H.c.}$		1068	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda\rho}u^\sigma\rangle\langle u_\sigma\chi_-\rangle$		2136
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma\rangle\langle u^\delta u_\rho f_{-\sigma\delta}\rangle+\text{H.c.}$		1069	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle\chi_-\rangle\langle f_{+\lambda\rho}u^\sigma u_\sigma\rangle$		2137
$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu f_-{}^{\sigma\delta}\rangle\langle W_{\nu\lambda}u_\rho u_\sigma u_\delta\rangle+\text{H.c.}$		1070	$i\varepsilon^{\mu\nu\lambda\rho}\langle\chi_-\rangle\langle W_{\mu\nu}f_{+\lambda\rho}\rangle\langle u^\sigma u_\sigma\rangle$		2138
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u^\sigma u^\delta u_\sigma f_{-\rho\delta}\rangle+\text{H.c.}$	490	1071	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle\chi_-\rangle\langle f_{+\lambda}{}^\sigma u_\rho u_\sigma\rangle+\text{H.c.}$		2139
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma\rangle\langle u^\delta u_\sigma f_{-\rho\delta}\rangle+\text{H.c.}$		1072	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda\rho}\chi_-\rangle\langle u^\sigma u_\sigma\rangle$		2140
$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma f_{-\mu}{}^\delta\rangle\langle W_{\nu\lambda}u_\rho u_\sigma u_\delta\rangle+\text{H.c.}$	491	1073	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma f_{+\rho\sigma}\chi_-\rangle+\text{H.c.}$	864	2141
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u^\sigma u^\delta u_\delta f_{-\rho\sigma}\rangle+\text{H.c.}$		1074	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda}{}^\sigma\chi_- f_{+\rho\sigma}\rangle$	865	2142
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u^\sigma\rangle\langle u^\delta u_\delta f_{-\rho\sigma}\rangle+\text{H.c.}$		1075	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda}{}^\sigma f_{+\rho\sigma}\chi_-\rangle$	866	2143
$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma f_{-\mu}{}^\delta\rangle\langle W_{\nu\lambda}u_\rho u_\delta u_\sigma\rangle+\text{H.c.}$	492	1076	$\varepsilon^{\mu\nu\lambda\rho}\langle\chi_-\rangle\langle W_{\mu\nu}f_{+\lambda}{}^\sigma f_{+\rho\sigma}\rangle$		2144
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\rangle\langle u_\lambda u_\rho u^\delta f_{-\sigma\delta}\rangle+\text{H.c.}$	493	1077	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u_\rho\chi_+\chi_-\rangle+\text{H.c.}$	867	2145
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u^\sigma u_\lambda u_\sigma u^\delta f_{-\rho\delta}\rangle+\text{H.c.}$		1078	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda u_\rho\chi_-\chi_+\rangle+\text{H.c.}$	868	2146
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\rangle\langle u_\lambda u_\sigma u^\delta f_{-\rho\delta}\rangle+\text{H.c.}$		1079	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\chi_+u_\rho\chi_-\rangle+\text{H.c.}$	869	2147
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\rangle\langle u_\lambda u^\delta u_\rho f_{-\sigma\delta}\rangle$		1080	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\chi_+\chi_-u_\rho\rangle+\text{H.c.}$	870	2148
$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu f_-{}^{\sigma\delta}\rangle\langle W_{\nu\lambda}u_\sigma u_\rho u_\delta\rangle$	494	1081	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\chi_-u_\rho\chi_+\rangle+\text{H.c.}$	871	2149
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u^\sigma u_\lambda u^\delta u_\sigma f_{-\rho\delta}\rangle+\text{H.c.}$	495	1082	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\chi_+u_\lambda u_\rho\chi_-\rangle+\text{H.c.}$	872	2150
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\rangle\langle u_\lambda u^\delta u_\sigma f_{-\rho\delta}\rangle+\text{H.c.}$		1083	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda u_\rho\chi_+\chi_-\rangle+\text{H.c.}$		2151
$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma f_{-\mu}{}^\delta\rangle\langle W_{\nu\lambda}u_\sigma u_\rho u_\delta\rangle+\text{H.c.}$	496	1084	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u_\lambda\rangle\langle u_\rho\chi_+\chi_-\rangle+\text{H.c.}$		2152
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u^\sigma u_\lambda u^\delta u_\delta f_{-\rho\sigma}\rangle+\text{H.c.}$		1085	$\varepsilon^{\mu\nu\lambda\rho}\langle\chi_+\chi_-\rangle\langle W_{\mu\nu}u_\lambda u_\rho\rangle$		2153
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\rangle\langle u_\lambda u^\delta u_\delta f_{-\rho\sigma}\rangle+\text{H.c.}$		1086	$\varepsilon^{\mu\nu\lambda\rho}\langle\chi_-\rangle\langle W_{\mu\nu}u_\lambda u_\rho\chi_+\rangle+\text{H.c.}$		2154
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\rangle\langle u_\sigma u_\lambda u^\delta f_{-\rho\delta}\rangle+\text{H.c.}$	497	1087	$\varepsilon^{\mu\nu\lambda\rho}\langle\chi_+\rangle\langle W_{\mu\nu}u_\lambda u_\rho\chi_-\rangle+\text{H.c.}$		2155
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u_\sigma\rangle\langle u_\lambda u^\delta f_{-\rho\delta}\rangle+\text{H.c.}$		1088	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle u_\lambda\chi_+u_\rho\chi_-\rangle$		2156
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\nu u_\lambda\rangle\langle u^\delta u_\sigma f_{-\rho\delta}\rangle+\text{H.c.}$		1089	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu\chi_-\rangle\langle W_{\nu\lambda}u_\rho\chi_+\rangle+\text{H.c.}$		2157
$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu f_{-\nu}{}^\sigma\rangle\langle W_{\lambda\rho}u^\delta u_\delta u_\sigma\rangle+\text{H.c.}$	498	1090	$\varepsilon^{\mu\nu\lambda\rho}\langle\chi_-\rangle\langle W_{\mu\nu}u_\lambda\chi_+u_\rho\rangle$		2158
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u^\delta\rangle\langle u_\lambda u_\delta f_{-\rho\sigma}\rangle+\text{H.c.}$		1091	$\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu\chi_+\rangle\langle W_{\nu\lambda}u_\rho\chi_-\rangle+\text{H.c.}$		2159
$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma f_{-\mu}{}^\delta\rangle\langle W_{\nu\sigma}u_\lambda u_\rho u_\delta\rangle+\text{H.c.}$		1092	$\varepsilon^{\mu\nu\lambda\rho}\langle\chi_+\rangle\langle W_{\mu\nu}u_\lambda\chi_-u_\rho\rangle$		2160
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma\rangle\langle u_\sigma u^\delta u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$		1093	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\chi_+\rangle\langle u_\lambda u_\rho\chi_-\rangle$		2161
$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma f_{-\mu\nu}\rangle\langle W_{\lambda\rho}u^\delta u_\delta u_\sigma\rangle+\text{H.c.}$		1094	$\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\chi_-\rangle\langle u_\lambda u_\rho\chi_+\rangle$		2162
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}u^\sigma u^\delta\rangle\langle u_\lambda u_\sigma f_{-\rho\delta}\rangle+\text{H.c.}$		1095	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda\rho}\chi_+\chi_-\rangle+\text{H.c.}$	873	2163
$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu f_{-\nu}{}^\sigma\rangle\langle W_{\lambda\sigma}u_\rho u^\delta u_\delta\rangle+\text{H.c.}$	499	1096	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\chi_+f_{+\lambda\rho}\chi_-\rangle+\text{H.c.}$	874	2164
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma\rangle\langle u_\nu u_\lambda u^\delta f_{-\rho\delta}\rangle+\text{H.c.}$		1097	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle f_{+\lambda\rho}\chi_+\chi_-\rangle+\text{H.c.}$	875	2165
$i\varepsilon^{\mu\nu\lambda\rho}\langle W_\mu{}^\sigma u_\sigma u_\nu\rangle\langle u_\lambda u^\delta f_{-\rho\delta}\rangle+\text{H.c.}$		1098	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}f_{+\lambda\rho}\rangle\langle\chi_+\chi_-\rangle$	876	2166
$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma f_{-\mu\sigma}\rangle\langle W_\nu{}^\delta u_\delta u_\lambda u_\rho\rangle+\text{H.c.}$		1099	$i\varepsilon^{\mu\nu\lambda\rho}\langle\chi_-\rangle\langle W_{\mu\nu}f_{+\lambda\rho}\chi_+\rangle+\text{H.c.}$	877	2167

Continued on next page

Table A2-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u_\sigma\rangle\langle u_\nu u^\delta u_\lambda f_{-\rho\delta}\rangle$		1100	$i\varepsilon^{\mu\nu\lambda\rho}\langle\chi_+\rangle\langle W_{\mu\nu}f_{+\lambda\rho}\chi_-\rangle+\text{H.c.}$	878	2168
$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u_\sigma u_\nu\rangle\langle u^\delta u_\lambda f_{-\rho\delta}\rangle+\text{H.c.}$		1101	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\chi_+\rangle\langle f_{+\lambda\rho}\chi_-\rangle$	879	2169
$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu {f_{-\nu}}^\sigma\rangle\langle {W_\lambda}^\delta u_\delta u_\rho u_\sigma\rangle+\text{H.c.}$		1102	$i\varepsilon^{\mu\nu\lambda\rho}\langle f_{+\mu\nu}\rangle\langle W_{\lambda\rho}\chi_+\chi_-\rangle+\text{H.c.}$	880	
$i\varepsilon^{\mu\nu\lambda\rho}\langle {W_\mu}^\sigma u_\sigma\rangle\langle u_\nu u^\delta u_\delta f_{-\lambda\rho}\rangle+\text{H.c.}$	500	1103	$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\chi_-\rangle\langle f_{+\lambda\rho}\chi_+\rangle$	881	2170
$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma f_{-\mu\nu}\rangle\langle {W_\lambda}^\delta u_\delta u_\rho u_\sigma\rangle+\text{H.c.}$	501		$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\chi_- u_\lambda\nabla_\rho\chi_-\rangle+\text{H.c.}$	882	
$i\varepsilon^{\mu\nu\lambda\rho}\langle u^\sigma f_{-\mu\nu}\rangle\langle {W_\lambda}^\delta u_\delta u_\sigma u_\rho\rangle+\text{H.c.}$	502		$i\varepsilon^{\mu\nu\lambda\rho}\langle W_{\mu\nu}\rangle\langle\chi_-\rangle\langle f_{+\lambda\rho}\chi_+\rangle$		2171
$i\varepsilon^{\mu\nu\lambda\rho}\langle u_\mu f_{-\nu\lambda}\rangle\langle {W_\rho}^\sigma u_\sigma u^\delta u_\delta\rangle+\text{H.c.}$	503		$i\varepsilon^{\mu\nu\lambda\rho}\langle\chi_+\rangle\langle\chi_-\rangle\langle W_{\mu\nu}f_{+\lambda\rho}\rangle$		2172

XI. THE NNLO CHIRAL LAGRANGIANS IN HLS REPRESENTATION

Table A3. The NNLO chiral Lagrangians with vector mesons are considered within the Hidden Local Symmetry (HLS) framework. In this context, *n* represents a cumulative index.

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda V_{\nu\lambda}\rangle+\text{H.c.}$	1	1	$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle$	343	687
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\perp\mu}\hat{a}_\perp{}^\lambda V_{\nu\lambda}\rangle+\text{H.c.}$	2	2	$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$	344	688
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_\perp{}^\lambda V_{\mu\lambda}\rangle$		3	$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\mu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$	345	689
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\perp\mu}V_{\nu\lambda}\rangle$		4	$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\mu}\rangle$		690
$i\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda V_{\nu\lambda}\rangle$		5	$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$	346	691
$i\langle\hat{a}_\perp{}^\mu V^{\nu\lambda}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\rangle$		6	$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\parallel\mu}\hat{a}_{\parallel\lambda}\rangle$		692
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}V^{\nu\lambda}\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	3	7	$\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$	347	693
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu V_\mu{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	4	8	$\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$	348	694
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu V_\nu{}^\lambda\hat{\mathscr{V}}_{\mu\lambda}\rangle+\text{H.c.}$	5	9	$\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		695
$\langle\hat{a}_\perp{}^\mu V_\mu{}^\nu\hat{a}_\perp{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	6	10	$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$	349	696
$\langle\hat{a}_\perp{}^\mu V^{\nu\lambda}\hat{a}_{\perp\mu}\hat{\mathscr{V}}_{\nu\lambda}\rangle$	7	11	$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$	350	697
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\rangle\langle V^{\nu\lambda}\hat{\mathscr{V}}_{\nu\lambda}\rangle$		12	$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$	351	698
$\langle\hat{\mathscr{V}}^{\mu\nu}\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\perp\lambda}V_{\mu\nu}\rangle$	8	13	$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$	352	699
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\rangle\langle V_\mu{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$		14	$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\mu}\rangle+\text{H.c.}$		700
$\langle\hat{\mathscr{V}}^{\mu\nu}\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\perp\mu}V_{\nu\lambda}\rangle+\text{H.c.}$	9	15	$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\mu}\rangle$		701
$\langle\hat{a}_\perp{}^\mu V_\mu{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$		16	$\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$	353	702
$\langle\hat{a}_\perp{}^\mu V^{\nu\lambda}\rangle\langle\hat{a}_{\perp\mu}\hat{\mathscr{V}}_{\nu\lambda}\rangle$		17	$\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$	354	703
$\langle\hat{a}_\perp{}^\mu V^{\nu\lambda}\rangle\langle\hat{a}_{\perp\nu}\hat{\mathscr{V}}_{\mu\lambda}\rangle$		18	$\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		704
$i\langle V^{\mu\nu}\hat{\mathscr{V}}_\mu{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$	10	19	$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		705
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{\chi}_+V_{\mu\nu}\rangle+\text{H.c.}$	11	20	$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		706
$i\langle\hat{a}_\perp{}^\mu\hat{\chi}_+\hat{a}_\perp{}^\nu V_{\mu\nu}\rangle$	12	21	$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$	355	707
$i\langle\hat{\chi}_+\rangle\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu V_{\mu\nu}\rangle$		22	$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$	356	708
$\langle\hat{\chi}_+V^{\mu\nu}\hat{\mathscr{V}}_{\mu\nu}\rangle+\text{H.c.}$	13	23	$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\perp\mu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle$		709

Continued on next page

Table A3-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle\hat{\chi}_+\rangle\langle V^{\mu\nu}\hat{\mathscr{V}}_{\mu\nu}\rangle$	14	24	$\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		710
$\langle\hat{\mathscr{V}}^{\mu\nu}\rangle\langle\hat{\chi}_+V_{\mu\nu}\rangle$	15	25	$\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$	357	711
$\langle\hat{\chi}_-V^{\mu\nu}\hat{\mathscr{A}}_{\mu\nu}\rangle+\text{H.c.}$	16	26	$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$	358	712
$\langle\hat{a}_\perp{}^\mu D^\nu\hat{\chi}_-V_{\mu\nu}\rangle+\text{H.c.}$	17	27	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\mu}\rangle+\text{H.c.}$		713
$i\langle V^{\mu\nu}\hat{\mathscr{H}}_\mu{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle$	18	28	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$	359	714
$i\langle V^{\mu\nu}\hat{\mathscr{A}}_\mu{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	19	29	$\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		715
$i\langle V^{\mu\nu}\hat{\mathscr{A}}_\mu{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle$	20	30	$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\perp\lambda}\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\rangle$	360	716
$i\langle\hat{a}_\perp{}^\mu D^\nu V_\mu{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	21	31	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\mu}\hat{a}_{\parallel\lambda}\rangle$		717
$i\langle\hat{a}_\perp{}^\mu D^\nu V_\nu{}^\lambda\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$	22	32	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$	361	718
$\langle D^\mu V_\mu{}^\nu D^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$	23	33	$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		719
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}V^{\nu\lambda}V_{\nu\lambda}\rangle$	24	34	$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		720
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu V_\mu{}^\lambda V_{\nu\lambda}\rangle$	25	35	$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$	362	721
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu V_\nu{}^\lambda V_{\mu\lambda}\rangle$	26	36	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\mu}\rangle+\text{H.c.}$		722
$\langle\hat{a}_\perp{}^\mu V_\mu{}^\nu\hat{a}_\perp{}^\lambda V_{\nu\lambda}\rangle+\text{H.c.}$	27	37	$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		723
$\langle\hat{a}_\perp{}^\mu V^{\nu\lambda}\hat{a}_{\perp\mu}V_{\nu\lambda}\rangle$	28	38	$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\perp\mu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$	363	724
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\rangle\langle V^{\nu\lambda}V_{\nu\lambda}\rangle$		39	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\parallel\mu}\hat{a}_{\parallel\lambda}\rangle$		725
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\rangle\langle V_\mu{}^\lambda V_{\nu\lambda}\rangle$		40	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		726
$\langle\hat{a}_\perp{}^\mu V_\mu{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda V_{\nu\lambda}\rangle$	29	41	$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle$		727
$\langle\hat{a}_\perp{}^\mu V^{\nu\lambda}\rangle\langle\hat{a}_{\perp\mu}V_{\nu\lambda}\rangle$	30	42	$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\perp\mu}\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		728
$\langle\hat{a}_\perp{}^\mu V^{\nu\lambda}\rangle\langle\hat{a}_{\perp\nu}V_{\mu\lambda}\rangle$		43	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\rangle$		729
$i\langle V^{\mu\nu}V_\mu{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$	31	44	$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		730
$\langle\hat{\chi}_+V^{\mu\nu}V_{\mu\nu}\rangle$	32	45	$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle$		731
$\langle\hat{\chi}_+\rangle\langle V^{\mu\nu}V_{\mu\nu}\rangle$	33	46	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		732
$\langle D^\mu V_\mu{}^\nu D^\lambda V_{\nu\lambda}\rangle$	34	47	$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		733
$\langle D^\mu V^{\nu\lambda}D_\mu V_{\nu\lambda}\rangle$	35	48	$\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		734
$i\langle V^{\mu\nu}V_\mu{}^\lambda V_{\nu\lambda}\rangle$	36	49	$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		735
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{\chi}_-\rangle+\text{H.c.}$	37	50	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\mu}\rangle+\text{H.c.}$		736
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{\chi}_-\rangle+\text{H.c.}$	38	51	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\perp\mu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		737
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_{\parallel\mu}\hat{\chi}_-\rangle+\text{H.c.}$		52	$\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		738
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\nu\hat{a}_{\perp\nu}\hat{\chi}_-\rangle+\text{H.c.}$		53	$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		739
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\mu}\hat{a}_{\perp\nu}\hat{\chi}_-\rangle+\text{H.c.}$	39	54	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		740
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_{\perp\mu}\hat{\chi}_-\rangle+\text{H.c.}$		55	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		741
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{\chi}_-\rangle+\text{H.c.}$		56	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\mu}\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle$		742
$\langle\hat{\chi}_-\rangle\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		57	$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		743
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_{\perp\mu}\hat{\chi}_-\rangle+\text{H.c.}$		58	$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle$		744
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{\chi}_-\hat{\mathscr{V}}_{\mu\nu}\rangle+\text{H.c.}$	40	59	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\mu}\rangle+\text{H.c.}$		745

Continued on next page

Table A3-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{V}}_{\mu\nu}\hat{\chi}_-\rangle+\text{H.c.}$	41	60	$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\nu}\rangle$		746
$i\langle\hat{a}_\perp{}^\mu\hat{\chi}_-\hat{a}_\parallel{}^\nu\hat{\mathscr{V}}_{\mu\nu}\rangle+\text{H.c.}$	42	61	$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		747
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{\chi}_-\hat{\mathscr{V}}_{\mu\nu}\rangle$	43	62	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\mu}\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		748
$i\langle\hat{\mathscr{V}}^{\mu\nu}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{\chi}_-\rangle+\text{H.c.}$	44	63	$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		749
$i\langle\hat{\chi}_-\rangle\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{V}}_{\mu\nu}\rangle+\text{H.c.}$	45	64	$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		750
$i\langle\hat{a}_\perp{}^\mu\hat{\chi}_-\rangle\langle\hat{a}_\parallel{}^\nu\hat{\mathscr{V}}_{\mu\nu}\rangle$		65	$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\lambda\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle$		751
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{\chi}_-\hat{\mathscr{V}}_{\mu\nu}\rangle+\text{H.c.}$		66	$\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		752
$i\langle\hat{a}_\perp{}^\mu\hat{\mathscr{V}}_\mu{}^\nu\rangle\langle\hat{a}_{\parallel\nu}\hat{\chi}_-\rangle$		67	$\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		753
$i\langle\hat{\chi}_-\rangle\langle\hat{\mathscr{V}}^{\mu\nu}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle$		68	$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		754
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{\mathscr{V}}_\mu{}^\nu\rangle\langle\hat{a}_{\perp\nu}\hat{\chi}_-\rangle$		69	$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		755
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{\chi}_+\hat{\chi}_-\rangle+\text{H.c.}$	46	70	$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\mu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		756
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{\chi}_-\hat{\chi}_+\rangle+\text{H.c.}$	47	71	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\perp\lambda}\hat{a}_{\parallel\mu}\rangle$		757
$\langle\hat{a}_\perp{}^\mu\hat{\chi}_+\hat{a}_{\parallel\mu}\hat{\chi}_-\rangle+\text{H.c.}$	48	72	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\perp\mu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		758
$\langle\hat{\chi}_-\rangle\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{\chi}_+\rangle+\text{H.c.}$		73	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\perp\lambda}\hat{a}_{\parallel\nu}\rangle$		759
$\langle\hat{\chi}_+\rangle\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{\chi}_-\rangle+\text{H.c.}$		74	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		760
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\perp\mu}\hat{\chi}_+\hat{\chi}_-\rangle+\text{H.c.}$		75	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		761
$i\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	49	76	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\perp\lambda}\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\rangle$		762
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	50	77	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		763
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$		78	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\perp\mu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		764
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	51	79	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		765
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\nu}\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$	52	80	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\mu}\rangle$		766
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\hat{\mathscr{H}}_{\mu\nu}\rangle+\text{H.c.}$		81	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		767
$i\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\nu\hat{a}_\perp{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$		82	$\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		768
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\mu}\hat{a}_\perp{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	53	83	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\mu}\rangle+\text{H.c.}$		769
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\perp{}^\lambda\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$		84	$i\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	364	770
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\perp\mu}\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	54	85	$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	365	771
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\perp\nu}\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$		86	$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{V}}_{\mu\lambda}\rangle$	366	772
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\perp\lambda}\hat{\mathscr{H}}_{\mu\nu}\rangle+\text{H.c.}$		87	$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\mu}\hat{\mathscr{V}}_{\nu\lambda}\rangle$	367	773
$i\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$	55	88	$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	368	774
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$	56	89	$i\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$		775
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\mu\lambda}\rangle+\text{H.c.}$		90	$i\langle\hat{\mathscr{V}}^{\mu\nu}\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		776
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$	57	91	$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$		777
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\nu}\hat{\mathscr{A}}_{\mu\lambda}\rangle+\text{H.c.}$	58	92	$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$		778
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\hat{\mathscr{A}}_{\mu\nu}\rangle+\text{H.c.}$		93	$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{V}}_{\mu\lambda}\rangle+\text{H.c.}$		779
$i\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\nu\hat{a}_\perp{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$		94	$i\langle\hat{a}_\parallel{}^\mu\hat{\mathscr{V}}^{\nu\lambda}\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		780

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Table A3-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\mu}\hat{a}_\perp{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$		95	$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$		781
$i\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$		96	$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle$	369	782
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$		97	$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle$	370	783
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_\perp{}^\lambda\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$		98	$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{a}_{\parallel\mu}\hat{\chi}_+\rangle$	371	784
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\perp\mu}\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$		99	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle+\text{H.c.}$	372	785
$i\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$		100	$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle$	373	786
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$		101	$\langle\hat{a}_\parallel{}^\mu\hat{\chi}_+\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\rangle$	374	787
$i\langle\hat{a}_\parallel{}^\mu\hat{\mathscr{A}}{}^{\nu\lambda}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\rangle$		102	$\langle\hat{\chi}_+\rangle\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\rangle$	375	788
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_\perp{}^\lambda\hat{\mathscr{A}}_{\mu\lambda}\rangle+\text{H.c.}$		103	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle$		789
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\perp\mu}\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$		104	$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle$	376	790
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{V}}_\mu{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	59	105	$\langle\hat{\chi}_+\rangle\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\rangle$		791
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{V}}_\nu{}^\lambda\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$	60	106	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle$		792
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{H}}_\mu{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	61	107	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle$		793
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{H}}_\nu{}^\lambda\hat{\mathscr{V}}_{\mu\lambda}\rangle+\text{H.c.}$	62	108	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{\chi}_+\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\rangle$		794
$\langle\hat{a}_\perp{}^\mu\hat{\mathscr{V}}_\mu{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	63	109	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\parallel\mu}\hat{\chi}_+\rangle$		795
$\langle\hat{a}_\perp{}^\mu\hat{\mathscr{V}}{}^{\nu\lambda}\hat{a}_{\parallel\nu}\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$	64	110	$\langle\hat{\chi}_+\rangle\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\rangle$		796
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{\mathscr{V}}{}^{\nu\lambda}\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$	65	111	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle$		797
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{V}}_\mu{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$	66	112	$\langle\hat{\chi}_+\rangle\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\rangle$		798
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{V}}_\nu{}^\lambda\hat{\mathscr{A}}_{\mu\lambda}\rangle+\text{H.c.}$	67	113	$i\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle+\text{H.c.}$	377	799
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{\mathscr{A}}{}^{\nu\lambda}\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	68	114	$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle+\text{H.c.}$	378	800
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{A}}_\mu{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	69	115	$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda V_{\mu\lambda}\rangle$	379	801
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{A}}_\nu{}^\lambda\hat{\mathscr{V}}_{\mu\lambda}\rangle+\text{H.c.}$	70	116	$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\mu}V_{\nu\lambda}\rangle$	380	802
$\langle\hat{a}_\perp{}^\mu\hat{\mathscr{V}}_\mu{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$	71	117	$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle+\text{H.c.}$	381	803
$\langle\hat{a}_\perp{}^\mu\hat{\mathscr{V}}{}^{\nu\lambda}\hat{a}_{\parallel\nu}\hat{\mathscr{A}}_{\mu\lambda}\rangle+\text{H.c.}$	72	118	$i\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle$		804
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\mu}D^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	73	119	$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle$		805
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\perp{}^\nu D^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	74	120	$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle+\text{H.c.}$		806
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{\mathscr{V}}_\mu{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle$	75	121	$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda V_{\mu\lambda}\rangle+\text{H.c.}$		807
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{\mathscr{A}}_{\mu\lambda}\rangle+\text{H.c.}$		103	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle$		789
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\perp\mu}\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$		104	$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle$	376	790
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{V}}_\mu{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	59	105	$\langle\hat{\chi}_+\rangle\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\rangle$		791
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{V}}_\nu{}^\lambda\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$	60	106	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle$		792
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{H}}_\mu{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	61	107	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle$		793
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{H}}_\nu{}^\lambda\hat{\mathscr{V}}_{\mu\lambda}\rangle+\text{H.c.}$	62	108	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{\chi}_+\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\rangle$		794
$\langle\hat{a}_\perp{}^\mu\hat{\mathscr{V}}_\mu{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	63	109	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\parallel\mu}\hat{\chi}_+\rangle$		795

Continued on next page

Table A3-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle\hat{a}_\perp{}^\mu\hat{\mathscr{V}}^{\nu\lambda}\hat{a}_{\parallel\nu}\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$	64	110	$\langle\hat{\chi}_+\rangle\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\rangle$		796
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{\mathscr{V}}^{\nu\lambda}\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$	65	111	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle$		797
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{V}}_\mu{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$	66	112	$\langle\hat{\chi}_+\rangle\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\rangle$		798
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{V}}_\nu{}^\lambda\hat{\mathscr{A}}_{\mu\lambda}\rangle+\text{H.c.}$	67	113	$i\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle+\text{H.c.}$	377	799
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{\mathscr{A}}^{\nu\lambda}\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	68	114	$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle+\text{H.c.}$	378	800
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{A}}_\mu{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	69	115	$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda V_{\mu\lambda}\rangle$	379	801
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{A}}_\nu{}^\lambda\hat{\mathscr{V}}_{\mu\lambda}\rangle+\text{H.c.}$	70	116	$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\mu}V_{\nu\lambda}\rangle$	380	802
$\langle\hat{a}_\perp{}^\mu\hat{\mathscr{V}}_\mu{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$	71	117	$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle+\text{H.c.}$	381	803
$\langle\hat{a}_\perp{}^\mu\hat{\mathscr{V}}^{\nu\lambda}\hat{a}_{\parallel\nu}\hat{\mathscr{A}}_{\mu\lambda}\rangle+\text{H.c.}$	72	118	$i\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle$		804
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\mu}D^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	73	119	$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle$		805
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\perp{}^\nu D^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	74	120	$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle+\text{H.c.}$		806
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{\mathscr{V}}_\mu{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle$	75	121	$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda V_{\mu\lambda}\rangle+\text{H.c.}$		807
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{\mathscr{V}}_\nu{}^\lambda\hat{\mathscr{H}}_{\mu\lambda}\rangle$	76	122	$i\langle\hat{a}_\parallel{}^\mu V^{\nu\lambda}\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		808
$\langle\hat{\mathscr{V}}^{\mu\nu}\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$		123	$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle$		809
$\langle\hat{\mathscr{V}}^{\mu\nu}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$		124	$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$	382	810
$\langle\hat{a}_\perp{}^\mu\hat{\mathscr{V}}_\mu{}^\nu\rangle\langle\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle$		125	$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$	383	811
$\langle\hat{a}_\perp{}^\mu\hat{\mathscr{V}}^{\nu\lambda}\rangle\langle\hat{a}_{\parallel\nu}\hat{\mathscr{H}}_{\mu\lambda}\rangle$		126	$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle$	384	812
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{\mathscr{V}}_\nu{}^\lambda\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$		127	$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$	385	813
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{\mathscr{V}}_\mu{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$		128	$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$	386	814
$\langle\hat{a}_\perp{}^\mu\hat{\mathscr{H}}_\mu{}^\nu\rangle\langle\hat{a}_\parallel{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$		129	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$	387	815
$\langle\hat{a}_\perp{}^\mu\hat{\mathscr{H}}^{\nu\lambda}\rangle\langle\hat{a}_{\parallel\nu}\hat{\mathscr{V}}_{\mu\lambda}\rangle$		130	$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$	388	816
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{\mathscr{V}}^{\nu\lambda}\hat{\mathscr{A}}_{\nu\lambda}\rangle$	77	131	$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$	389	817
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{\mathscr{V}}_\mu{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle$	78	132	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		818
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{\mathscr{V}}_\nu{}^\lambda\hat{\mathscr{A}}_{\mu\lambda}\rangle$	79	133	$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		819
$\langle\hat{\mathscr{V}}^{\mu\nu}\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\hat{\mathscr{A}}_{\mu\nu}\rangle+\text{H.c.}$		134	$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$	390	820
$\langle\hat{\mathscr{V}}^{\mu\nu}\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$		135	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle$		821
$\langle\hat{\mathscr{V}}^{\mu\nu}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$		136	$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		822
$\langle\hat{a}_\perp{}^\mu\hat{\mathscr{V}}_\mu{}^\nu\rangle\langle\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle$		137	$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$	391	823
$\langle\hat{a}_\perp{}^\mu\hat{\mathscr{V}}^{\nu\lambda}\rangle\langle\hat{a}_{\parallel\mu}\hat{\mathscr{A}}_{\nu\lambda}\rangle$		138	$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle$		824
$\langle\hat{a}_\perp{}^\mu\hat{\mathscr{V}}^{\nu\lambda}\rangle\langle\hat{a}_{\parallel\nu}\hat{\mathscr{A}}_{\mu\lambda}\rangle$		139	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		825
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{\mathscr{V}}_\nu{}^\lambda\hat{\mathscr{A}}_{\mu\lambda}\rangle+\text{H.c.}$		140	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		826
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{\mathscr{V}}_\mu{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$		141	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		827
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\perp\mu}\hat{\mathscr{V}}^{\nu\lambda}\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$		142	$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		828
$\langle\hat{a}_\perp{}^\mu\hat{\mathscr{A}}_\mu{}^\nu\rangle\langle\hat{a}_\parallel{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$		143	$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		829

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Table A3-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle \hat{a}_{\perp}{}^{\mu}\hat{\mathscr{A}}^{\nu\lambda}\rangle\langle \hat{a}_{\parallel\mu}\hat{\mathscr{V}}_{\nu\lambda}\rangle$		144	$\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle \hat{a}_{\parallel}{}^{\nu}\hat{a}_{\parallel}{}^{\lambda}\rangle\langle \hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		830
$\langle \hat{a}_{\perp}{}^{\mu}\hat{\mathscr{A}}^{\nu\lambda}\rangle\langle \hat{a}_{\parallel\nu}\hat{\mathscr{V}}_{\mu\lambda}\rangle$		145	$\langle \hat{a}_{\parallel}{}^{\mu}\hat{a}_{\parallel\mu}\rangle\langle \hat{a}_{\parallel}{}^{\nu}\hat{a}_{\parallel}{}^{\lambda}\rangle\langle \hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		831
$\langle \hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp}{}^{\nu}\rangle\langle \hat{a}_{\parallel\mu}D^{\lambda}\hat{\mathscr{V}}_{\nu\lambda}\rangle$		146	$\langle \hat{a}_{\parallel}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\rangle\langle \hat{a}_{\parallel\mu}\hat{a}_{\parallel}{}^{\lambda}\rangle\langle \hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		832
$\langle D^{\mu}\hat{\mathscr{V}}_{\mu}{}^{\nu}\rangle\langle \hat{a}_{\perp}{}^{\lambda}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$	80	147	$\langle \hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel\mu}H^{\nu\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	392	833
$\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle \hat{a}_{\perp}{}^{\nu}\hat{a}_{\perp\nu}D^{\lambda}\hat{\mathscr{V}}_{\mu\lambda}\rangle$		148	$\langle \hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel\mu}\rangle\langle H^{\nu\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle$		834
$\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle \hat{a}_{\perp}{}^{\nu}\hat{a}_{\perp}{}^{\lambda}D_{\nu}\hat{\mathscr{V}}_{\mu\lambda}\rangle+\text{H.c.}$		149	$\langle H^{\mu\nu}\rangle\langle \hat{a}_{\perp}{}^{\lambda}\hat{a}_{\parallel\lambda}\hat{\mathscr{H}}_{\mu\nu}\rangle+\text{H.c.}$		835
$\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle \hat{a}_{\perp}{}^{\nu}\hat{a}_{\perp\mu}D^{\lambda}\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$		150	$\langle H^{\mu\nu}\rangle\langle \hat{a}_{\perp\mu}\hat{a}_{\parallel}{}^{\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$		836
$\langle \hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel\mu}\rangle\langle \hat{a}_{\perp}{}^{\nu}D^{\lambda}\hat{\mathscr{V}}_{\nu\lambda}\rangle$		151	$\langle H^{\mu\nu}\rangle\langle \hat{a}_{\perp\mu}\hat{a}_{\parallel}{}^{\lambda}\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$		837
$i\langle \hat{a}_{\parallel}{}^{\mu}\hat{\mathscr{V}}_{\mu}{}^{\nu}D^{\lambda}\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	81	152	$\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle \hat{\chi}_{+}\rangle\langle D^{\nu}H_{\mu\nu}\rangle$		838
$i\langle \hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{\chi}_{+}\hat{\mathscr{H}}_{\mu\nu}\rangle+\text{H.c.}$	82	153	$\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle D^{\nu}D_{\nu}D^{\lambda}H_{\mu\lambda}\rangle$	393	839
$i\langle \hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{\mathscr{H}}_{\mu\nu}\hat{\chi}_{+}\rangle+\text{H.c.}$	83	154	$i\langle \hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel\mu}\hat{a}_{\parallel}{}^{\lambda}H_{\nu\lambda}\rangle+\text{H.c.}$	394	840
$i\langle \hat{a}_{\perp}{}^{\mu}\hat{\chi}_{+}\hat{a}_{\parallel}{}^{\nu}\hat{\mathscr{H}}_{\mu\nu}\rangle+\text{H.c.}$		155	$i\langle \hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel}{}^{\lambda}\hat{a}_{\parallel\mu}H_{\nu\lambda}\rangle+\text{H.c.}$		841
$i\langle \hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{\chi}_{+}\hat{\mathscr{A}}_{\mu\nu}\rangle+\text{H.c.}$	84	156	$i\langle \hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel\mu}\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel}{}^{\lambda}H_{\nu\lambda}\rangle+\text{H.c.}$	395	842
$i\langle \hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{\mathscr{A}}_{\mu\nu}\hat{\chi}_{+}\rangle+\text{H.c.}$	85	157	$i\langle \hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{a}_{\perp}{}^{\lambda}\hat{a}_{\parallel\mu}H_{\nu\lambda}\rangle+\text{H.c.}$		843
$i\langle \hat{a}_{\perp}{}^{\mu}\hat{\chi}_{+}\hat{a}_{\parallel}{}^{\nu}\hat{\mathscr{A}}_{\mu\nu}\rangle+\text{H.c.}$		158	$i\langle \hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp}{}^{\nu}\rangle\langle \hat{a}_{\parallel\mu}\hat{a}_{\parallel}{}^{\lambda}H_{\nu\lambda}\rangle+\text{H.c.}$		844
$i\langle \hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel\mu}D_{\nu}\hat{\chi}_{+}\rangle+\text{H.c.}$		159	$i\langle H^{\mu\nu}\rangle\langle \hat{a}_{\perp}{}^{\lambda}\hat{a}_{\perp\mu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		845
$i\langle \hat{\chi}_{+}\rangle\langle \hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{\mathscr{H}}_{\mu\nu}\rangle+\text{H.c.}$		160	$i\langle H^{\mu\nu}\rangle\langle \hat{a}_{\perp\mu}\hat{a}_{\perp}{}^{\lambda}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		846
$i\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle \hat{a}_{\perp}{}^{\nu}\hat{\chi}_{+}\hat{\mathscr{H}}_{\mu\nu}\rangle+\text{H.c.}$		161	$i\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle \hat{a}_{\perp}{}^{\nu}\hat{a}_{\perp}{}^{\lambda}\hat{a}_{\parallel\nu}H_{\mu\lambda}\rangle+\text{H.c.}$		847
$i\langle \hat{\chi}_{+}\rangle\langle \hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{\mathscr{A}}_{\mu\nu}\rangle+\text{H.c.}$		162	$i\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle \hat{a}_{\perp}{}^{\nu}\hat{a}_{\perp}{}^{\lambda}\hat{a}_{\parallel\lambda}H_{\mu\nu}\rangle+\text{H.c.}$		848
$i\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle \hat{a}_{\perp}{}^{\nu}\hat{\chi}_{+}\hat{\mathscr{A}}_{\mu\nu}\rangle+\text{H.c.}$		163	$i\langle H^{\mu\nu}\rangle\langle \hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\perp}{}^{\lambda}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		849
$i\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle \hat{a}_{\perp}{}^{\nu}\hat{a}_{\perp\mu}D_{\nu}\hat{\chi}_{+}\rangle+\text{H.c.}$		164	$\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle \hat{a}_{\parallel}{}^{\nu}\hat{\mathscr{V}}_{\mu}{}^{\lambda}H_{\nu\lambda}\rangle+\text{H.c.}$	396	850
$\langle \hat{a}_{\parallel}{}^{\mu}D^{\nu}\hat{\chi}_{+}\hat{\mathscr{V}}_{\mu\nu}\rangle+\text{H.c.}$	86	165	$\langle H^{\mu\nu}\rangle\langle \hat{a}_{\parallel}{}^{\lambda}\hat{a}_{\parallel\mu}\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	397	851
$\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle D^{\nu}\hat{\chi}_{+}\hat{\mathscr{V}}_{\mu\nu}\rangle$	87	166	$\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle \hat{a}_{\parallel}{}^{\nu}\rangle\langle \hat{\mathscr{V}}_{\mu}{}^{\lambda}H_{\nu\lambda}\rangle$		852
$\langle \hat{\mathscr{V}}^{\mu\nu}\rangle\langle \hat{a}_{\parallel\mu}D_{\nu}\hat{\chi}_{+}\rangle$	88	167	$\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle H^{\nu\lambda}\rangle\langle \hat{a}_{\parallel\nu}\hat{\mathscr{V}}_{\mu\lambda}\rangle$		853
$\langle D^{\mu}\hat{\chi}_{+}\rangle\langle \hat{a}_{\parallel}{}^{\nu}\hat{\mathscr{V}}_{\mu\nu}\rangle$	89	168	$\langle \hat{\mathscr{V}}^{\mu\nu}\rangle\langle H_{\mu}{}^{\lambda}\rangle\langle \hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		854
$\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle \hat{\chi}_{+}D^{\nu}\hat{\mathscr{V}}_{\mu\nu}\rangle$	90	169	$\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle \hat{\mathscr{V}}^{\nu\lambda}\rangle\langle \hat{a}_{\parallel\nu}H_{\mu\lambda}\rangle$		855
$\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle D^{\nu}\hat{\chi}_{+}\rangle\langle \hat{\mathscr{V}}_{\mu\nu}\rangle$		170	$i\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle \hat{a}_{\parallel}{}^{\nu}\hat{\chi}_{+}H_{\mu\nu}\rangle+\text{H.c.}$		856
$\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle \hat{\chi}_{+}\rangle\langle D^{\nu}\hat{\mathscr{V}}_{\mu\nu}\rangle$		171	$\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle \hat{a}_{\parallel}{}^{\nu}V_{\mu}{}^{\lambda}H_{\nu\lambda}\rangle+\text{H.c.}$	398	857
$i\langle \hat{a}_{\parallel}{}^{\mu}\hat{\chi}_{+}D_{\mu}\hat{\chi}_{+}\rangle+\text{H.c.}$	91	172	$\langle H^{\mu\nu}\rangle\langle \hat{a}_{\parallel}{}^{\lambda}\hat{a}_{\parallel\mu}V_{\nu\lambda}\rangle+\text{H.c.}$	399	858
$i\langle \hat{a}_{\parallel}{}^{\mu}\hat{\chi}_{-}D_{\mu}\hat{\chi}_{-}\rangle+\text{H.c.}$	92	173	$\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle \hat{a}_{\parallel}{}^{\nu}\rangle\langle V_{\mu}{}^{\lambda}H_{\nu\lambda}\rangle$		859
$\langle \hat{a}_{\parallel}{}^{\mu}D^{\nu}\hat{\chi}_{-}\hat{\mathscr{H}}_{\mu\nu}\rangle+\text{H.c.}$	93	174	$\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle H^{\nu\lambda}\rangle\langle \hat{a}_{\parallel\nu}V_{\mu\lambda}\rangle$		860
$\langle \hat{a}_{\parallel}{}^{\mu}D^{\nu}\hat{\chi}_{-}\hat{\mathscr{A}}_{\mu\nu}\rangle+\text{H.c.}$	94	175	$\langle \hat{a}_{\parallel}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{a}_{\parallel}{}^{\lambda}D_{\mu}H_{\nu\lambda}\rangle+\text{H.c.}$	400	861
$i\langle \hat{a}_{\parallel}{}^{\mu}\hat{\mathscr{H}}_{\mu}{}^{\nu}D^{\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	95	176	$\langle D^{\mu}H_{\mu}{}^{\nu}\rangle\langle \hat{a}_{\parallel\nu}\hat{a}_{\parallel}{}^{\lambda}\hat{a}_{\parallel\lambda}\rangle$	401	862
$i\langle \hat{a}_{\parallel}{}^{\mu}\hat{\mathscr{A}}_{\mu}{}^{\nu}D^{\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	96	177	$\langle \hat{a}_{\parallel}{}^{\mu}\rangle\langle \hat{a}_{\parallel}{}^{\nu}\hat{a}_{\parallel}{}^{\lambda}D_{\mu}H_{\nu\lambda}\rangle$	402	863
$i\langle \hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}D_{\nu}D^{\lambda}\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$	97	178	$\langle \hat{a}_{\parallel}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\rangle\langle \hat{a}_{\parallel}{}^{\lambda}D_{\mu}H_{\nu\lambda}\rangle$	403	864

Continued on next page

Table A3-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}D_{\nu}D^{\lambda}\hat{\mathscr{A}}_{\mu\lambda}\rangle+\text{H.c.}$	98	179	$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle D^{\nu}H_{\nu}{}^{\lambda}\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\lambda}\rangle$		865
$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle D^{\nu}D_{\nu}D^{\lambda}\hat{\mathscr{V}}_{\mu\lambda}\rangle$	99	180	$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle D^{\nu}H_{\mu\nu}\rangle\langle\hat{a}_{\parallel}{}^{\lambda}\hat{a}_{\parallel\lambda}\rangle$		866
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{\chi}_{-}V_{\mu\nu}\rangle+\text{H.c.}$	100	181	$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\parallel}{}^{\nu}\rangle\langle\hat{a}_{\parallel}{}^{\lambda}D_{\mu}H_{\nu\lambda}\rangle$		867
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}V_{\mu\nu}\hat{\chi}_{-}\rangle+\text{H.c.}$	101	182	$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle D_{\mu}H^{\nu\lambda}\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		868
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{\chi}_{-}\hat{a}_{\parallel}{}^{\nu}V_{\mu\nu}\rangle+\text{H.c.}$	102	183	$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle D^{\nu}H_{\mu}{}^{\lambda}\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		869
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\rangle\langle\hat{\chi}_{-}V_{\mu\nu}\rangle$	103	184	$i\langle\hat{a}_{\parallel}{}^{\mu}\hat{a}_{\parallel\mu}\hat{a}_{\parallel}{}^{\nu}\hat{a}_{\parallel}{}^{\lambda}H_{\nu\lambda}\rangle+\text{H.c.}$	404	870
$i\langle\hat{\chi}_{-}\rangle\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}V_{\mu\nu}\rangle+\text{H.c.}$	104	185	$i\langle\hat{a}_{\parallel}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{a}_{\parallel\mu}\hat{a}_{\parallel}{}^{\lambda}H_{\nu\lambda}\rangle+\text{H.c.}$	405	871
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{\chi}_{-}\rangle\langle\hat{a}_{\parallel}{}^{\nu}V_{\mu\nu}\rangle$		186	$i\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel}{}^{\nu}\hat{a}_{\parallel}{}^{\lambda}H_{\nu\lambda}\rangle+\text{H.c.}$		872
$i\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\perp}{}^{\nu}\hat{\chi}_{-}V_{\mu\nu}\rangle+\text{H.c.}$		187	$i\langle\hat{a}_{\parallel}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel}{}^{\lambda}H_{\nu\lambda}\rangle+\text{H.c.}$		873
$i\langle\hat{a}_{\perp}{}^{\mu}V_{\mu}{}^{\nu}\rangle\langle\hat{a}_{\parallel\nu}\hat{\chi}_{-}\rangle$	105	188	$i\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\parallel}{}^{\nu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel}{}^{\lambda}H_{\mu\lambda}\rangle+\text{H.c.}$		874
$i\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{\chi}_{-}\rangle\langle\hat{a}_{\perp}{}^{\nu}V_{\mu\nu}\rangle$		189	$\langle\hat{a}_{\parallel}{}^{\mu}\hat{a}_{\parallel\mu}H^{\nu\lambda}H_{\nu\lambda}\rangle$	406	875
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}V_{\mu}{}^{\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	106	190	$\langle\hat{a}_{\parallel}{}^{\mu}\hat{a}_{\parallel\mu}\rangle\langle H^{\nu\lambda}H_{\nu\lambda}\rangle$	407	876
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}V_{\nu}{}^{\lambda}\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$	107	191	$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\parallel\mu}\rangle\langle H^{\nu\lambda}H_{\nu\lambda}\rangle$		877
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{\mathscr{H}}_{\mu}{}^{\lambda}V_{\nu\lambda}\rangle+\text{H.c.}$	108	192	$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle H^{\nu\lambda}\rangle\langle\hat{a}_{\parallel\mu}H_{\nu\lambda}\rangle$		878
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{\mathscr{H}}_{\nu}{}^{\lambda}V_{\mu\lambda}\rangle+\text{H.c.}$	109	193	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{\chi}_{-}V_{\lambda\rho}\rangle+\text{H.c.}$	408	879
$\langle\hat{a}_{\perp}{}^{\mu}V_{\mu}{}^{\nu}\hat{a}_{\parallel}{}^{\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	110	194	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{\chi}_{-}\hat{a}_{\perp\nu}V_{\lambda\rho}\rangle$	409	880
$\langle\hat{a}_{\perp}{}^{\mu}V^{\nu\lambda}\hat{a}_{\parallel\nu}\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$	111	195	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\chi}_{-}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}V_{\lambda\rho}\rangle$		881
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel\mu}V^{\nu\lambda}\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$	112	196	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\chi}_{-}V_{\mu\nu}\hat{\mathscr{V}}_{\lambda\rho}\rangle+\text{H.c.}$	410	882
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}V_{\mu}{}^{\lambda}\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$	113	197	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\chi}_{-}\rangle\langle V_{\mu\nu}\hat{\mathscr{V}}_{\lambda\rho}\rangle$	411	883
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}V_{\nu}{}^{\lambda}\hat{\mathscr{A}}_{\mu\lambda}\rangle+\text{H.c.}$	114	198	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\mathscr{V}}_{\mu\nu}\rangle\langle\hat{\chi}_{-}V_{\lambda\rho}\rangle$	412	884
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel\mu}\hat{\mathscr{A}}^{\nu\lambda}V_{\nu\lambda}\rangle+\text{H.c.}$	115	199	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}V_{\lambda}{}^{\sigma}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$	413	885
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{\mathscr{A}}_{\mu}{}^{\lambda}V_{\nu\lambda}\rangle+\text{H.c.}$	116	200	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp}{}^{\sigma}V_{\nu\lambda}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		886
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{\mathscr{A}}_{\nu}{}^{\lambda}V_{\mu\lambda}\rangle+\text{H.c.}$	117	201	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}V_{\nu\lambda}\hat{a}_{\perp}{}^{\sigma}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		887
$\langle\hat{a}_{\perp}{}^{\mu}V_{\mu}{}^{\nu}\hat{a}_{\parallel}{}^{\lambda}\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$	118	202	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}V_{\lambda}{}^{\sigma}\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$	414	888
$\langle\hat{a}_{\perp}{}^{\mu}V^{\nu\lambda}\hat{a}_{\parallel\mu}\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$	119	203	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp}{}^{\sigma}V_{\nu\lambda}\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$		889
$\langle\hat{a}_{\perp}{}^{\mu}V^{\nu\lambda}\hat{a}_{\parallel\nu}\hat{\mathscr{A}}_{\mu\lambda}\rangle+\text{H.c.}$	120	204	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp}{}^{\sigma}V_{\nu\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$		890
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel\mu}D^{\lambda}V_{\nu\lambda}\rangle+\text{H.c.}$	121	205	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}V_{\nu\lambda}\hat{a}_{\perp}{}^{\sigma}\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$		891
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel\nu}D^{\lambda}V_{\mu\lambda}\rangle+\text{H.c.}$	122	206	$\varepsilon^{\mu\nu\lambda\rho}\langle V_{\mu\nu}\hat{\mathscr{V}}_{\lambda}{}^{\sigma}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$	415	892
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel\mu}\hat{a}_{\perp}{}^{\nu}D^{\lambda}V_{\nu\lambda}\rangle+\text{H.c.}$	123	207	$\varepsilon^{\mu\nu\lambda\rho}\langle V_{\mu\nu}\hat{\mathscr{V}}_{\lambda}{}^{\sigma}\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$	416	893
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\rangle\langle V_{\mu}{}^{\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle$	124	208	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}D_{\nu}V_{\lambda}{}^{\sigma}\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$	417	894
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\rangle\langle V_{\nu}{}^{\lambda}\hat{\mathscr{H}}_{\mu\lambda}\rangle$	125	209	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}D^{\sigma}V_{\nu\lambda}\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$	418	895
$\langle\hat{a}_{\perp}{}^{\mu}V_{\mu}{}^{\nu}\rangle\langle\hat{a}_{\parallel}{}^{\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle$		210	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\mathscr{V}}_{\mu}{}^{\sigma}\rangle\langle V_{\nu\lambda}\hat{\mathscr{H}}_{\rho\sigma}\rangle$	419	896
$\langle\hat{a}_{\perp}{}^{\mu}V^{\nu\lambda}\rangle\langle\hat{a}_{\parallel\nu}\hat{\mathscr{H}}_{\mu\lambda}\rangle$		211	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\mathscr{V}}_{\mu}{}^{\sigma}\rangle\langle V_{\nu\lambda}\hat{\mathscr{A}}_{\rho\sigma}\rangle$	420	897
$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\perp}{}^{\nu}V_{\nu}{}^{\lambda}\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$		212	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\mathscr{V}}_{\mu}{}^{\sigma}\rangle\langle\hat{a}_{\perp\nu}D_{\lambda}V_{\rho\sigma}\rangle$	421	898
$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\perp}{}^{\nu}V_{\mu}{}^{\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$		213	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\mathscr{V}}_{\mu}{}^{\sigma}\rangle\langle\hat{a}_{\perp\nu}D_{\sigma}V_{\lambda\rho}\rangle$		899

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Table A3-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle \hat{a}_\perp{}^\mu \hat{\mathscr{H}}_\mu^{\ \nu} \rangle \langle \hat{a}_\parallel{}^\lambda V_{\nu\lambda} \rangle$		214	$i\varepsilon^{\mu\nu\lambda\rho} \langle \hat{\chi}_+ V_{\mu\nu} \hat{\mathscr{A}}_{\lambda\rho} \rangle + \text{H.c.}$	422	900
$\langle \hat{a}_\perp{}^\mu \hat{\mathscr{H}}^{\nu\lambda} \rangle \langle \hat{a}_{\parallel\nu} V_{\mu\lambda} \rangle$		215	$i\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} D_\nu \hat{\chi}_+ V_{\lambda\rho} \rangle + \text{H.c.}$	423	901
$\langle \hat{a}_\perp{}^\mu \hat{a}_{\parallel\mu} \rangle \langle V^{\nu\lambda} \hat{\mathscr{A}}_{\nu\lambda} \rangle$	126	216	$i\varepsilon^{\mu\nu\lambda\rho} \langle \hat{\chi}_- V_{\mu\nu} V_{\lambda\rho} \rangle$	424	902
$\langle \hat{a}_\perp{}^\mu \hat{a}_\parallel{}^\nu \rangle \langle V_\mu{}^\lambda \hat{\mathscr{A}}_{\nu\lambda} \rangle$	127	217	$i\varepsilon^{\mu\nu\lambda\rho} \langle \hat{\chi}_- \rangle \langle V_{\mu\nu} V_{\lambda\rho} \rangle$	425	903
$\langle \hat{a}_\perp{}^\mu \hat{a}_\parallel{}^\nu \rangle \langle V_\nu{}^\lambda \hat{\mathscr{A}}_{\mu\lambda} \rangle$	128	218	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} V_{\nu\lambda} D^\sigma V_{\rho\sigma} \rangle + \text{H.c.}$	426	904
$\langle \hat{a}_\perp{}^\mu V_\mu{}^\nu \rangle \langle \hat{a}_\parallel{}^\lambda \hat{\mathscr{A}}_{\nu\lambda} \rangle$		219	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} V_\nu{}^\sigma D_\lambda V_{\rho\sigma} \rangle + \text{H.c.}$	427	905
$\langle \hat{a}_\perp{}^\mu V^{\nu\lambda} \rangle \langle \hat{a}_{\parallel\mu} \hat{\mathscr{A}}_{\nu\lambda} \rangle$		220	$i\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_{\perp\nu} \hat{a}_{\perp\lambda} \hat{a}_{\perp\rho} \hat{a}_\perp{}^\sigma \hat{a}_{\parallel\sigma} \rangle + \text{H.c.}$		906
$\langle \hat{a}_\perp{}^\mu V^{\nu\lambda} \rangle \langle \hat{a}_{\parallel\nu} \hat{\mathscr{A}}_{\mu\lambda} \rangle$		221	$i\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_{\perp\nu} \hat{a}_{\perp\lambda} \hat{a}_\perp{}^\sigma \hat{a}_{\perp\rho} \hat{a}_{\parallel\sigma} \rangle + \text{H.c.}$		907
$\langle \hat{a}_\parallel{}^\mu \rangle \langle \hat{a}_\perp{}^\nu V_\nu{}^\lambda \hat{\mathscr{A}}_{\mu\lambda} \rangle + \text{H.c.}$		222	$i\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_{\perp\nu} \hat{a}_{\perp\lambda} \hat{a}_\perp{}^\sigma \hat{a}_{\perp\sigma} \hat{a}_{\parallel\rho} \rangle + \text{H.c.}$	428	908
$\langle \hat{a}_\parallel{}^\mu \rangle \langle \hat{a}_\perp{}^\nu V_\mu{}^\lambda \hat{\mathscr{A}}_{\nu\lambda} \rangle + \text{H.c.}$		223	$i\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_{\perp\nu} \hat{a}_\perp{}^\sigma \hat{a}_{\perp\lambda} \hat{a}_{\perp\sigma} \hat{a}_{\parallel\rho} \rangle + \text{H.c.}$		909
$\langle \hat{a}_\parallel{}^\mu \rangle \langle \hat{a}_{\perp\mu} V^{\nu\lambda} \hat{\mathscr{A}}_{\nu\lambda} \rangle + \text{H.c.}$		224	$i\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_{\perp\nu} \hat{a}_\perp{}^\sigma \hat{a}_{\perp\sigma} \hat{a}_{\perp\lambda} \hat{a}_{\parallel\rho} \rangle + \text{H.c.}$		910
$\langle \hat{a}_\perp{}^\mu \hat{\mathscr{A}}_\mu^{\ \nu} \rangle \langle \hat{a}_\parallel{}^\lambda V_{\nu\lambda} \rangle$		225	$i\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_\perp{}^\sigma \hat{a}_{\perp\nu} \hat{a}_{\perp\lambda} \hat{a}_{\perp\sigma} \hat{a}_{\parallel\rho} \rangle + \text{H.c.}$		911
$\langle \hat{a}_\perp{}^\mu \hat{\mathscr{A}}^{\nu\lambda} \rangle \langle \hat{a}_{\parallel\mu} V_{\nu\lambda} \rangle$		226	$i\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_{\perp\nu} \hat{a}_{\perp\lambda} \rangle \langle \hat{a}_{\perp\rho} \hat{a}_\perp{}^\sigma \hat{a}_{\parallel\sigma} \rangle + \text{H.c.}$		912
$\langle \hat{a}_\perp{}^\mu \hat{\mathscr{A}}^{\nu\lambda} \rangle \langle \hat{a}_{\parallel\nu} V_{\mu\lambda} \rangle$		227	$i\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_\parallel{}^\sigma \rangle \langle \hat{a}_{\perp\nu} \hat{a}_{\perp\lambda} \hat{a}_{\perp\rho} \hat{a}_{\perp\sigma} \rangle$		913
$\langle \hat{a}_\perp{}^\mu \hat{a}_\perp{}^\nu \rangle \langle \hat{a}_{\parallel\mu} D^\lambda V_{\nu\lambda} \rangle$		228	$i\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_{\perp\nu} \hat{a}_{\perp\lambda} \rangle \langle \hat{a}_\perp{}^\sigma \hat{a}_{\perp\sigma} \hat{a}_{\parallel\rho} \rangle$		914
$\langle \hat{a}_\parallel{}^\mu \rangle \langle \hat{a}_\perp{}^\nu \hat{a}_{\perp\nu} D^\lambda V_{\mu\lambda} \rangle$		229	$i\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_\perp{}^\sigma \hat{a}_{\parallel\mu} \rangle \langle \hat{a}_{\perp\nu} \hat{a}_{\perp\lambda} \hat{a}_{\perp\rho} \hat{a}_{\perp\sigma} \rangle$		915
$\langle \hat{a}_\parallel{}^\mu \rangle \langle \hat{a}_\perp{}^\nu \hat{a}_\perp{}^\lambda D_\nu V_{\mu\lambda} \rangle + \text{H.c.}$	129	230	$i\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\parallel\mu} \rangle \langle \hat{a}_{\perp\nu} \hat{a}_{\perp\lambda} \hat{a}_{\perp\rho} \hat{a}_\perp{}^\sigma \hat{a}_{\perp\sigma} \rangle$		916
$\langle \hat{a}_\parallel{}^\mu \rangle \langle \hat{a}_\perp{}^\nu \hat{a}_{\perp\mu} D^\lambda V_{\nu\lambda} \rangle + \text{H.c.}$		231	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_{\perp\nu} \hat{a}_{\perp\lambda} \hat{a}_\parallel{}^\sigma \hat{\mathscr{V}}_{\rho\sigma} \rangle + \text{H.c.}$		917
$\langle \hat{a}_\perp{}^\mu \hat{a}_{\parallel\mu} \rangle \langle \hat{a}_\perp{}^\nu D^\lambda V_{\nu\lambda} \rangle$		232	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_{\perp\nu} \hat{a}_\perp{}^\sigma \hat{a}_{\parallel\lambda} \hat{\mathscr{V}}_{\rho\sigma} \rangle + \text{H.c.}$	429	918
$\langle \hat{a}_\perp{}^\mu \hat{a}_\parallel{}^\nu \rangle \langle \hat{a}_{\perp\nu} D^\lambda V_{\mu\lambda} \rangle$		233	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_{\perp\nu} \hat{a}_\perp{}^\sigma \hat{a}_{\parallel\sigma} \hat{\mathscr{V}}_{\lambda\rho} \rangle + \text{H.c.}$	430	919
$i\langle \hat{a}_\parallel{}^\mu D_\mu V^{\nu\lambda} \hat{\mathscr{V}}_{\nu\lambda} \rangle + \text{H.c.}$	130	234	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_\perp{}^\sigma \hat{a}_{\perp\nu} \hat{a}_{\parallel\lambda} \hat{\mathscr{V}}_{\rho\sigma} \rangle + \text{H.c.}$		920
$i\langle \hat{a}_\parallel{}^\mu D^\nu V_\nu{}^\lambda \hat{\mathscr{V}}_{\mu\lambda} \rangle + \text{H.c.}$	131	235	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_\perp{}^\sigma \hat{a}_{\perp\sigma} \hat{a}_{\parallel\nu} \hat{\mathscr{V}}_{\lambda\rho} \rangle + \text{H.c.}$	431	921
$\langle \hat{a}_\parallel{}^\mu D^\nu \hat{\chi}_+ V_{\mu\nu} \rangle + \text{H.c.}$	132	236	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_{\perp\nu} \hat{a}_{\parallel\lambda} \hat{a}_\perp{}^\sigma \hat{\mathscr{V}}_{\rho\sigma} \rangle + \text{H.c.}$	432	922
$\langle \hat{a}_\parallel{}^\mu \rangle \langle D^\nu \hat{\chi}_+ V_{\mu\nu} \rangle$	133	237	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_{\perp\nu} \hat{a}_\parallel{}^\sigma \hat{a}_{\perp\lambda} \hat{\mathscr{V}}_{\rho\sigma} \rangle + \text{H.c.}$		923
$\langle D^\mu \hat{\chi}_+ \rangle \langle \hat{a}_\parallel{}^\nu V_{\mu\nu} \rangle$	134	238	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_{\perp\nu} \hat{a}_\parallel{}^\sigma \hat{a}_{\perp\sigma} \hat{\mathscr{V}}_{\lambda\rho} \rangle + \text{H.c.}$	433	924
$\langle \hat{a}_\parallel{}^\mu \rangle \langle \hat{\chi}_+ D^\nu V_{\mu\nu} \rangle$	135	239	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_\perp{}^\sigma \hat{a}_{\parallel\nu} \hat{a}_{\perp\lambda} \hat{\mathscr{V}}_{\rho\sigma} \rangle + \text{H.c.}$		925
$i\langle \hat{a}_\parallel{}^\mu V_\mu{}^\nu D^\lambda V_{\nu\lambda} \rangle + \text{H.c.}$	136	240	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_\perp{}^\sigma \hat{a}_{\parallel\nu} \hat{a}_{\perp\sigma} \hat{\mathscr{V}}_{\lambda\rho} \rangle + \text{H.c.}$		926
$i\langle \hat{a}_\parallel{}^\mu V^{\nu\lambda} D_\mu V_{\nu\lambda} \rangle + \text{H.c.}$	137	241	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_\perp{}^\sigma \hat{a}_{\parallel\sigma} \hat{a}_{\perp\nu} \hat{\mathscr{V}}_{\lambda\rho} \rangle + \text{H.c.}$		927
$\langle \hat{a}_\perp{}^\mu \hat{a}_{\perp\mu} \hat{a}_\perp{}^\nu \hat{a}_{\perp\nu} \hat{a}_\parallel{}^\lambda \hat{a}_{\parallel\lambda} \rangle$	138	242	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{\mathscr{V}}_\mu{}^\sigma \rangle \langle \hat{a}_{\perp\nu} \hat{a}_{\perp\lambda} \hat{a}_{\perp\sigma} \hat{a}_{\parallel\rho} \rangle + \text{H.c.}$		928
$\langle \hat{a}_\perp{}^\mu \hat{a}_{\perp\mu} \hat{a}_\perp{}^\nu \hat{a}_\perp{}^\lambda \hat{a}_{\parallel\nu} \hat{a}_{\parallel\lambda} \rangle + \text{H.c.}$	139	243	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{\mathscr{V}}_{\mu\nu} \rangle \langle \hat{a}_{\perp\lambda} \hat{a}_{\perp\rho} \hat{a}_\perp{}^\sigma \hat{a}_{\parallel\sigma} \rangle + \text{H.c.}$		929
$\langle \hat{a}_\perp{}^\mu \hat{a}_{\perp\mu} \hat{a}_\perp{}^\nu \hat{a}_\perp{}^\lambda \hat{a}_{\parallel\lambda} \hat{a}_{\parallel\nu} \rangle + \text{H.c.}$	140	244	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_\perp{}^\sigma \rangle \langle \hat{a}_{\perp\nu} \hat{a}_{\parallel\lambda} \hat{\mathscr{V}}_{\rho\sigma} \rangle + \text{H.c.}$		930
$\langle \hat{a}_\perp{}^\mu \hat{a}_\perp{}^\nu \hat{a}_{\perp\mu} \hat{a}_{\perp\nu} \hat{a}_\parallel{}^\lambda \hat{a}_{\parallel\lambda} \rangle$	141	245	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_\perp{}^\sigma \rangle \langle \hat{a}_{\perp\nu} \hat{a}_{\parallel\sigma} \hat{\mathscr{V}}_{\lambda\rho} \rangle + \text{H.c.}$		931
$\langle \hat{a}_\perp{}^\mu \hat{a}_\perp{}^\nu \hat{a}_{\perp\mu} \hat{a}_\perp{}^\lambda \hat{a}_{\parallel\nu} \hat{a}_{\parallel\lambda} \rangle + \text{H.c.}$	142	246	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_\perp{}^\sigma \rangle \langle \hat{a}_{\perp\sigma} \hat{a}_{\parallel\nu} \hat{\mathscr{V}}_{\lambda\rho} \rangle + \text{H.c.}$		932
$\langle \hat{a}_\perp{}^\mu \hat{a}_\perp{}^\nu \hat{a}_{\perp\mu} \hat{a}_\perp{}^\lambda \hat{a}_{\parallel\lambda} \hat{a}_{\parallel\nu} \rangle + \text{H.c.}$	143	247	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{\mathscr{V}}_{\mu\nu} \rangle \langle \hat{a}_{\perp\lambda} \hat{a}_\perp{}^\sigma \hat{a}_{\perp\sigma} \hat{a}_{\parallel\rho} \rangle + \text{H.c.}$	434	933
$\langle \hat{a}_\perp{}^\mu \hat{a}_\perp{}^\nu \hat{a}_{\perp\nu} \hat{a}_{\perp\mu} \hat{a}_\parallel{}^\lambda \hat{a}_{\parallel\lambda} \rangle$		248	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_\parallel{}^\sigma \rangle \langle \hat{a}_{\perp\mu} \hat{a}_{\perp\nu} \hat{a}_{\perp\sigma} \hat{\mathscr{V}}_{\lambda\rho} \rangle + \text{H.c.}$		934

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Table A3-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}\hat{a}_{\parallel\lambda}\rangle$		249	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_\perp{}^\sigma\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$		935
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\mu}\rangle$		250	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_\perp{}^\sigma\hat{a}_{\perp\sigma}\hat{\mathscr{V}}_{\lambda\rho}\rangle+\text{H.c.}$		936
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		251	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{\mathscr{V}}_\nu^\sigma\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\perp\sigma}\hat{a}_{\parallel\rho}\rangle+\text{H.c.}$		937
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\perp\mu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle$		252	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\perp{}^\sigma\hat{\mathscr{V}}_{\mu\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\perp\sigma}\hat{a}_{\parallel\rho}\rangle+\text{H.c.}$		938
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$	144	253	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{\mathscr{V}}_{\nu\lambda}\rangle\langle\hat{a}_{\perp\rho}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		939
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$	145	254	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\sigma}\hat{\mathscr{V}}_{\lambda\rho}\rangle+\text{H.c.}$		940
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\perp\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		255	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\sigma}\hat{\mathscr{V}}_{\lambda\rho}\rangle+\text{H.c.}$		941
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$	146	256	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_\perp{}^\sigma\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$		942
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\lambda\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle$	147	257	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{\mathscr{V}}_\lambda{}^\sigma\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$	435	943
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle$	148	258	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\hat{\mathscr{V}}_{\nu\lambda}\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$	436	944
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		259	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\hat{\mathscr{V}}_{\nu\sigma}\hat{\mathscr{V}}_{\lambda\rho}\rangle+\text{H.c.}$	437	945
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\mu}\rangle+\text{H.c.}$		260	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{\mathscr{V}}_{\nu\lambda}\hat{a}_\parallel{}^\sigma\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$	438	946
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\perp\nu}\hat{a}_{\parallel\mu}\rangle$		261	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\mathscr{V}}_\mu{}^\sigma\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$		947
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\nu\hat{a}_{\perp\nu}\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		262	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\mathscr{V}}_{\mu\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_\parallel{}^\sigma\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$		948
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle$		263	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{\mathscr{V}}_{\nu\lambda}\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$		949
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\perp\lambda}\hat{a}_{\parallel\nu}\rangle$		264	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{\mathscr{V}}_\lambda{}^\sigma\hat{\mathscr{V}}_{\rho\sigma}\rangle$		950
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\mu}\hat{a}_{\perp\nu}\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$	149	265	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{\chi}_+\rangle+\text{H.c.}$	439	951
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\mu}\hat{a}_\perp{}^\lambda\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		266	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\perp\rho}\hat{\chi}_+\rangle+\text{H.c.}$	440	952
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_{\perp\mu}\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		267	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{\chi}_+\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_{\perp\rho}\rangle$		953
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle$	150	268	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\chi}_+\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\rangle$		954
$\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\perp\nu}\hat{a}_{\perp\mu}\hat{a}_{\parallel\lambda}\rangle$		269	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_{\perp\rho}\hat{\chi}_+\rangle$		955
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		270	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{\chi}_+\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\rangle$		956
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\hat{a}_\perp{}^\nu\rangle\langle\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		271	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\perp\rho}\hat{\chi}_+\rangle$		957
$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_\perp{}^\lambda\hat{a}_{\perp\lambda}\rangle$		272	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{\chi}_+\hat{\mathscr{V}}_{\lambda\rho}\rangle+\text{H.c.}$	441	958
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_\perp{}^\lambda\hat{a}_{\perp\lambda}\hat{a}_{\parallel\mu}\rangle$	151	273	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{\mathscr{V}}_{\lambda\rho}\hat{\chi}_+\rangle+\text{H.c.}$	442	959
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_\perp{}^\lambda\hat{a}_{\perp\mu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$	152	274	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle\hat{\chi}_+\hat{\mathscr{V}}_{\lambda\rho}\rangle$	443	960
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		275	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\mathscr{V}}_{\mu\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{\chi}_+\rangle+\text{H.c.}$	444	961
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\hat{a}_\perp{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		276	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\chi}_+\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{\mathscr{V}}_{\lambda\rho}\rangle+\text{H.c.}$	445	962
$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_\perp{}^\lambda\hat{a}_{\perp\lambda}\rangle$		277	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{\chi}_+\rangle\langle\hat{a}_{\parallel\nu}\hat{\mathscr{V}}_{\lambda\rho}\rangle$		963
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_\perp{}^\lambda\hat{a}_{\perp\mu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		278	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{\chi}_+\hat{\mathscr{V}}_{\lambda\rho}\rangle+\text{H.c.}$		964
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle$		279	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{\mathscr{V}}_{\nu\lambda}\rangle\langle\hat{a}_{\parallel\rho}\hat{\chi}_+\rangle$		965
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_{\perp\mu}\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		280	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\chi}_+\rangle\langle\hat{\mathscr{V}}_{\mu\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\rangle$		966
$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\rangle$		281	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{\mathscr{V}}_{\nu\lambda}\rangle\langle\hat{a}_{\perp\rho}\hat{\chi}_+\rangle$		967
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\mu}\rangle$		282	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{\chi}_-\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$	446	968
$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\perp\mu}\hat{a}_\perp{}^\lambda\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\rangle$		283	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{\mathscr{A}}_{\lambda\rho}\hat{\chi}_-\rangle+\text{H.c.}$	447	969

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Table A3-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\perp}{}^{\nu}\hat{a}_{\perp}{}^{\lambda}\hat{a}_{\perp\nu}\hat{a}_{\perp\mu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		284	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{\chi}_{-}\hat{a}_{\parallel\nu}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$		970
$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\perp}{}^{\nu}\hat{a}_{\perp}{}^{\lambda}\hat{a}_{\perp\lambda}\hat{a}_{\perp\nu}\hat{a}_{\parallel\mu}\rangle$		285	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\chi}_{-}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$		971
$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\perp}{}^{\nu}\hat{a}_{\perp}{}^{\lambda}\hat{a}_{\perp\lambda}\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		286	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{\chi}_{-}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$		972
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp}{}^{\nu}\hat{a}_{\perp}{}^{\lambda}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		287	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}D_{\rho}\hat{\chi}_{-}\rangle$		973
$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\perp}{}^{\nu}\hat{a}_{\perp}{}^{\lambda}\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		288	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle D_{\nu}\hat{\chi}_{-}\hat{\mathscr{V}}_{\lambda\rho}\rangle$	448	974
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp\mu}\rangle\langle\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel\nu}\hat{a}_{\perp}{}^{\lambda}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		289	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle D_{\nu}\hat{\chi}_{-}\rangle\langle\hat{\mathscr{V}}_{\lambda\rho}\rangle$		975
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp}{}^{\nu}\hat{a}_{\perp\nu}\hat{a}_{\perp}{}^{\lambda}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		290	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{\mathscr{H}}_{\lambda}{}^{\sigma}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$	449	976
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp\mu}\rangle\langle\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel}{}^{\lambda}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle$		291	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{\mathscr{H}}_{\nu}{}^{\sigma}\hat{a}_{\parallel\lambda}\hat{\mathscr{H}}_{\rho\sigma}\rangle$		977
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\rangle\langle\hat{a}_{\perp}{}^{\lambda}\hat{a}_{\perp\lambda}\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		292	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{\mathscr{A}}_{\lambda}{}^{\sigma}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$	450	978
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\rangle\langle\hat{a}_{\perp}{}^{\lambda}\hat{a}_{\perp\lambda}\hat{a}_{\perp\nu}\hat{a}_{\parallel\mu}\rangle+\text{H.c.}$		293	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel}{}^{\sigma}\hat{\mathscr{A}}_{\nu\lambda}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$	451	979
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\mu}\hat{a}_{\perp}{}^{\lambda}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		294	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{\mathscr{H}}_{\lambda}{}^{\sigma}\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$		980
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp\mu}\hat{a}_{\parallel}{}^{\nu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp}{}^{\lambda}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		295	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel}{}^{\sigma}\hat{\mathscr{H}}_{\nu\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$		981
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp\mu}\hat{a}_{\parallel}{}^{\nu}\rangle\langle\hat{a}_{\perp}{}^{\lambda}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\nu}\rangle$		296	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{\mathscr{A}}_{\nu\lambda}\hat{a}_{\parallel}{}^{\sigma}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		982
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp}{}^{\lambda}\hat{a}_{\parallel\lambda}\rangle$		297	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{\mathscr{A}}_{\nu}{}^{\sigma}\hat{a}_{\parallel\lambda}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		983
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel}{}^{\lambda}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle$		298	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{\mathscr{A}}_{\lambda}{}^{\sigma}\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$	452	984
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel}{}^{\lambda}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		299	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel}{}^{\sigma}\hat{\mathscr{A}}_{\nu\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$		985
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp\mu}\hat{a}_{\parallel}{}^{\nu}\hat{a}_{\parallel}{}^{\lambda}\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	153	300	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{\mathscr{H}}_{\lambda}{}^{\sigma}\hat{\mathscr{H}}_{\rho\sigma}\rangle$		986
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel\mu}\hat{a}_{\parallel}{}^{\lambda}\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	154	301	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel}{}^{\sigma}\rangle\langle\hat{a}_{\perp\mu}\hat{\mathscr{A}}_{\nu\lambda}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		987
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel}{}^{\lambda}\hat{\mathscr{V}}_{\mu\lambda}\rangle+\text{H.c.}$	155	302	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{\mathscr{A}}_{\lambda}{}^{\sigma}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		988
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel}{}^{\lambda}\hat{a}_{\parallel\mu}\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	156	303	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel}{}^{\sigma}\rangle\langle\hat{a}_{\perp\mu}\hat{\mathscr{A}}_{\nu\lambda}\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$		989
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel}{}^{\lambda}\hat{a}_{\parallel\nu}\hat{\mathscr{V}}_{\mu\lambda}\rangle+\text{H.c.}$		304	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{\mathscr{A}}_{\lambda}{}^{\sigma}\hat{\mathscr{A}}_{\rho\sigma}\rangle$		990
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel}{}^{\lambda}\hat{a}_{\parallel\lambda}\hat{\mathscr{V}}_{\mu\nu}\rangle+\text{H.c.}$	157	305	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}D^{\sigma}\hat{\mathscr{H}}_{\rho\sigma}\rangle$		991
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp\mu}\hat{a}_{\parallel}{}^{\nu}\hat{\mathscr{V}}_{\nu}{}^{\lambda}\hat{a}_{\parallel\lambda}\rangle$		306	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}D_{\nu}\hat{\mathscr{V}}_{\lambda}{}^{\sigma}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$	453	992
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel\mu}\hat{\mathscr{V}}_{\nu}{}^{\lambda}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$	158	307	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}D^{\sigma}\hat{\mathscr{V}}_{\nu\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$	454	993
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel\nu}\hat{\mathscr{V}}_{\mu}{}^{\lambda}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		308	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle D_{\nu}\hat{\mathscr{V}}_{\lambda}{}^{\sigma}\hat{\mathscr{H}}_{\rho\sigma}\rangle$	455	994
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel\mu}\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel}{}^{\lambda}\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	159	309	$\varepsilon^{\mu\nu\lambda\rho}\langle D_{\mu}\hat{\mathscr{V}}_{\nu}{}^{\sigma}\rangle\langle\hat{a}_{\parallel\lambda}\hat{\mathscr{H}}_{\rho\sigma}\rangle$		995
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{a}_{\perp\mu}\hat{a}_{\parallel}{}^{\lambda}\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	160	310	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle D_{\nu}\hat{\mathscr{V}}_{\lambda}{}^{\sigma}\hat{\mathscr{A}}_{\rho\sigma}\rangle$		996
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{a}_{\perp\nu}\hat{a}_{\parallel}{}^{\lambda}\hat{\mathscr{V}}_{\mu\lambda}\rangle+\text{H.c.}$	161	311	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle D^{\sigma}\hat{\mathscr{V}}_{\nu\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle$	456	997
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{a}_{\perp}{}^{\lambda}\hat{a}_{\parallel\mu}\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	162	312	$\varepsilon^{\mu\nu\lambda\rho}\langle D^{\sigma}\hat{\mathscr{V}}_{\mu\sigma}\rangle\langle\hat{a}_{\parallel\nu}\hat{\mathscr{A}}_{\lambda\rho}\rangle$		998
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{a}_{\perp}{}^{\lambda}\hat{a}_{\parallel\nu}\hat{\mathscr{V}}_{\mu\lambda}\rangle+\text{H.c.}$	163	313	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{\mathscr{V}}_{\nu\lambda}D^{\sigma}\hat{\mathscr{H}}_{\rho\sigma}\rangle$		999
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{a}_{\perp}{}^{\lambda}\hat{a}_{\parallel\lambda}\hat{\mathscr{V}}_{\mu\nu}\rangle+\text{H.c.}$	164	314	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}D_{\lambda}D^{\sigma}\hat{\mathscr{V}}_{\rho\sigma}\rangle$		1000
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel\mu}\hat{a}_{\parallel}{}^{\nu}\hat{a}_{\perp}{}^{\lambda}\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	165	315	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel}{}^{\sigma}V_{\rho\sigma}\rangle+\text{H.c.}$		1001
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{a}_{\parallel\mu}\hat{a}_{\perp}{}^{\lambda}\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$		316	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\perp}{}^{\sigma}\hat{a}_{\parallel\lambda}V_{\rho\sigma}\rangle+\text{H.c.}$	457	1002
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{a}_{\parallel\nu}\hat{a}_{\perp}{}^{\lambda}\hat{\mathscr{V}}_{\mu\lambda}\rangle$	166	317	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\sigma}V_{\lambda\rho}\rangle+\text{H.c.}$	458	1003
$i\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{a}_{\parallel}{}^{\lambda}\hat{a}_{\perp\mu}\hat{\mathscr{V}}_{\nu\lambda}\rangle$		318	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp}{}^{\sigma}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}V_{\rho\sigma}\rangle+\text{H.c.}$		1004

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Table A3-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle\hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$		319	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\hat{a}_{\perp\nu}\hat{a}_{\parallel\sigma}V_{\lambda\rho}\rangle+\text{H.c.}$		1005
$i\langle\hat{\mathscr{V}}^{\mu\nu}\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\perp\lambda}\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\rangle$		320	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\hat{a}_{\perp\sigma}\hat{a}_{\parallel\nu}V_{\lambda\rho}\rangle+\text{H.c.}$	459	1006
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$		321	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_\perp{}^\sigma V_{\rho\sigma}\rangle+\text{H.c.}$	460	1007
$i\langle\hat{a}_\parallel{}^\mu\hat{\mathscr{V}}_\mu{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		322	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\perp\lambda}V_{\rho\sigma}\rangle+\text{H.c.}$		1008
$i\langle\hat{\mathscr{V}}^{\mu\nu}\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\perp\mu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		323	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\perp\sigma}V_{\lambda\rho}\rangle+\text{H.c.}$	461	1009
$i\langle\hat{\mathscr{V}}^{\mu\nu}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		324	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\nu}\hat{a}_{\perp\lambda}V_{\rho\sigma}\rangle+\text{H.c.}$		1010
$i\langle\hat{a}_\parallel{}^\mu\hat{\mathscr{V}}^{\nu\lambda}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		325	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\nu}\hat{a}_{\perp\sigma}V_{\lambda\rho}\rangle+\text{H.c.}$		1011
$i\langle\hat{a}_\parallel{}^\mu\hat{\mathscr{V}}^{\nu\lambda}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\mu}\rangle$		326	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\sigma}\hat{a}_{\perp\nu}V_{\lambda\rho}\rangle+\text{H.c.}$		1012
$i\langle\hat{\mathscr{V}}^{\mu\nu}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		327	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}V_{\rho\sigma}\rangle+\text{H.c.}$		1013
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{V}}_{\mu\lambda}\rangle+\text{H.c.}$		328	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\sigma}V_{\lambda\rho}\rangle+\text{H.c.}$		1014
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\nu}\hat{\mathscr{V}}_{\mu\lambda}\rangle+\text{H.c.}$		329	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\rangle\langle\hat{a}_{\perp\sigma}\hat{a}_{\parallel\nu}V_{\lambda\rho}\rangle+\text{H.c.}$		1015
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\hat{\mathscr{V}}_{\mu\nu}\rangle+\text{H.c.}$		330	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\perp\sigma}V_{\lambda\rho}\rangle+\text{H.c.}$		1016
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$		331	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_\perp{}^\sigma V_{\rho\sigma}\rangle+\text{H.c.}$		1017
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$		332	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_\perp{}^\sigma\hat{a}_{\perp\sigma}V_{\lambda\rho}\rangle+\text{H.c.}$	462	1018
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\perp\mu}\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$		333	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}V_\nu{}^\sigma\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\perp\sigma}\hat{a}_{\parallel\rho}\rangle+\text{H.c.}$		1019
$i\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$		334	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\perp{}^\sigma V_{\mu\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\perp\sigma}\hat{a}_{\parallel\rho}\rangle+\text{H.c.}$		1020
$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\perp\mu}\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$		335	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}V_{\nu\lambda}\rangle\langle\hat{a}_{\perp\rho}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1021
$i\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$		336	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\sigma}V_{\lambda\rho}\rangle+\text{H.c.}$		1022
$i\langle\hat{\mathscr{V}}^{\mu\nu}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		337	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\sigma}V_{\lambda\rho}\rangle+\text{H.c.}$		1023
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$		338	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_\perp{}^\sigma V_{\rho\sigma}\rangle+\text{H.c.}$		1024
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\perp{}^\lambda\hat{\mathscr{V}}_{\mu\lambda}\rangle+\text{H.c.}$		339	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}V_\lambda{}^\sigma\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$	463	1025
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\perp\mu}\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$		340	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma V_{\nu\lambda}\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$	464	1026
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\mu}\hat{a}_\perp{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$		341	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma V_{\nu\sigma}\hat{\mathscr{V}}_{\lambda\rho}\rangle+\text{H.c.}$	465	1027
$i\langle\hat{a}_\perp{}^\mu\hat{\mathscr{V}}_\mu{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		342	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{\mathscr{V}}_\lambda{}^\sigma V_{\rho\sigma}\rangle+\text{H.c.}$	466	1028
$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\hat{\mathscr{V}}^{\nu\lambda}\hat{\mathscr{V}}_{\nu\lambda}\rangle$	167	343	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\hat{\mathscr{V}}_{\nu\lambda}V_{\rho\sigma}\rangle+\text{H.c.}$	467	1029
$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{V}}_\mu{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$	168	344	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\hat{\mathscr{V}}_{\nu\sigma}V_{\lambda\rho}\rangle+\text{H.c.}$	468	1030
$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{V}}_\nu{}^\lambda\hat{\mathscr{V}}_{\mu\lambda}\rangle$	169	345	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}V_{\nu\lambda}\hat{a}_\parallel{}^\sigma\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$	469	1031
$\langle\hat{a}_\parallel{}^\mu\hat{\mathscr{V}}_\mu{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	170	346	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}V_\nu{}^\sigma\hat{a}_{\parallel\lambda}\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$	470	1032
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\hat{\mathscr{V}}^{\nu\lambda}\hat{\mathscr{V}}_{\nu\lambda}\rangle$	171	347	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\mathscr{V}}_\mu{}^\sigma\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}V_{\rho\sigma}\rangle+\text{H.c.}$		1033
$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{\mathscr{V}}^{\nu\lambda}\hat{\mathscr{V}}_{\nu\lambda}\rangle$	172	348	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\mathscr{V}}_\mu{}^\sigma\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\sigma}V_{\lambda\rho}\rangle+\text{H.c.}$		1034
$\langle\hat{\mathscr{V}}^{\mu\nu}\rangle\langle\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\hat{\mathscr{V}}_{\mu\nu}\rangle$	173	349	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\mathscr{V}}_{\mu\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_\parallel{}^\sigma V_{\rho\sigma}\rangle+\text{H.c.}$		1035
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\hat{\mathscr{V}}_\mu{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	174	350	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}V_{\nu\lambda}\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$		1036
$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{\mathscr{V}}_\mu{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$	175	351	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}V_{\nu\sigma}\hat{\mathscr{V}}_{\lambda\rho}\rangle+\text{H.c.}$		1037
$\langle\hat{\mathscr{V}}^{\mu\nu}\rangle\langle\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\mu}\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	176	352	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}V_\lambda{}^\sigma\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$		1038
$\langle\hat{a}_\parallel{}^\mu\hat{\mathscr{V}}_\mu{}^\nu\rangle\langle\hat{a}_\parallel{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$	177	353	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{\chi}_+V_{\lambda\rho}\rangle+\text{H.c.}$	471	1039

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Table A3-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle \hat{a}_\parallel{}^\mu \hat{\mathcal{V}}^{\nu\lambda}\rangle\langle \hat{a}_{\parallel\mu}\hat{\mathcal{V}}_{\nu\lambda}\rangle$	178	354	$\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}V_{\lambda\rho}\hat{\chi}_+\rangle+\text{H.c.}$	472	1040
$\langle \hat{a}_\parallel{}^\mu \hat{\mathcal{V}}^{\nu\lambda}\rangle\langle \hat{a}_{\parallel\nu}\hat{\mathcal{V}}_{\mu\lambda}\rangle$	179	355	$\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{\chi}_+\hat{a}_{\parallel\nu}V_{\lambda\rho}\rangle+\text{H.c.}$	473	1041
$\langle \hat{a}_\parallel{}^\mu\rangle\langle \hat{a}_{\parallel\mu}\rangle\langle \hat{\mathcal{V}}^{\nu\lambda}\hat{\mathcal{V}}_{\nu\lambda}\rangle$		356	$\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle \hat{\chi}_+V_{\lambda\rho}\rangle$	474	1042
$\langle \hat{a}_\parallel{}^\mu\rangle\langle \hat{\mathcal{V}}^{\nu\lambda}\rangle\langle \hat{a}_{\parallel\mu}\hat{\mathcal{V}}_{\nu\lambda}\rangle$		357	$\varepsilon^{\mu\nu\lambda\rho}\langle \hat{\chi}_+\rangle\langle \hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}V_{\lambda\rho}\rangle+\text{H.c.}$	475	1043
$\langle \hat{\mathcal{V}}^{\mu\nu}\rangle\langle \hat{\mathcal{V}}_{\mu\nu}\rangle\langle \hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		358	$\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{\chi}_+\rangle\langle \hat{a}_{\parallel\nu}V_{\lambda\rho}\rangle$		1044
$\langle \hat{a}_\parallel{}^\mu\rangle\langle \hat{a}_\parallel{}^\nu\rangle\langle \hat{\mathcal{V}}_\mu{}^\lambda\hat{\mathcal{V}}_{\nu\lambda}\rangle$		359	$\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}\rangle\langle \hat{a}_{\perp\nu}\hat{\chi}_+V_{\lambda\rho}\rangle+\text{H.c.}$		1045
$\langle \hat{a}_\parallel{}^\mu\rangle\langle \hat{\mathcal{V}}^{\nu\lambda}\rangle\langle \hat{a}_{\parallel\nu}\hat{\mathcal{V}}_{\mu\lambda}\rangle$		360	$\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}V_{\nu\lambda}\rangle\langle \hat{a}_{\parallel\rho}\hat{\chi}_+\rangle$	476	1046
$\langle \hat{\mathcal{V}}^{\mu\nu}\rangle\langle \hat{\mathcal{V}}_\mu{}^\lambda\rangle\langle \hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		361	$\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}\rangle\langle \hat{\chi}_+\rangle\langle \hat{a}_{\perp\nu}V_{\lambda\rho}\rangle$		1047
$\langle \hat{a}_\parallel{}^\mu\rangle\langle \hat{\mathcal{V}}_\mu{}^\nu\rangle\langle \hat{a}_\parallel{}^\lambda\hat{\mathcal{V}}_{\nu\lambda}\rangle$		362	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}D_\nu\hat{\chi}_-V_{\lambda\rho}\rangle+\text{H.c.}$	477	1048
$\langle \hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle+\text{H.c.}$	180	363	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}\rangle\langle D_\nu\hat{\chi}_-V_{\lambda\rho}\rangle$	478	1049
$\langle \hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle+\text{H.c.}$	181	364	$i\varepsilon^{\mu\nu\lambda\rho}\langle D_\mu\hat{\chi}_-\rangle\langle \hat{a}_{\parallel\nu}V_{\lambda\rho}\rangle$	479	1050
$\langle \hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_{\parallel\mu}\hat{\chi}_+\rangle+\text{H.c.}$	182	365	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}\rangle\langle \hat{\chi}_-D_\nu V_{\lambda\rho}\rangle$		1051
$\langle \hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\nu\hat{\chi}_+\hat{a}_{\parallel\nu}\rangle$		366	$\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}D_\nu V_\lambda{}^\sigma\hat{\mathcal{H}}_{\rho\sigma}\rangle+\text{H.c.}$	480	1052
$\langle \hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\mu}\hat{\chi}_+\hat{a}_{\parallel\nu}\rangle$	183	367	$\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}D^\sigma V_{\nu\lambda}\hat{\mathcal{H}}_{\rho\sigma}\rangle+\text{H.c.}$	481	1053
$\langle \hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{\chi}_+\hat{a}_{\parallel\mu}\rangle$		368	$\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}D^\sigma V_{\nu\lambda}\hat{\mathcal{A}}_{\rho\sigma}\rangle+\text{H.c.}$	482	1054
$\langle \hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle+\text{H.c.}$	184	369	$\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}D^\sigma V_{\nu\sigma}\hat{\mathcal{A}}_{\lambda\rho}\rangle+\text{H.c.}$	483	1055
$\langle \hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle+\text{H.c.}$	185	370	$\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}\rangle\langle D_\nu V_\lambda{}^\sigma\hat{\mathcal{H}}_{\rho\sigma}\rangle$	484	1056
$\langle \hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\perp\nu}\hat{a}_{\parallel\mu}\hat{\chi}_+\rangle+\text{H.c.}$		371	$\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}\rangle\langle D^\sigma V_{\nu\lambda}\hat{\mathcal{H}}_{\rho\sigma}\rangle$		1057
$\langle \hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_{\perp\nu}\hat{\chi}_+\rangle$	186	372	$\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}\rangle\langle D_\nu V_\lambda{}^\sigma\hat{\mathcal{A}}_{\rho\sigma}\rangle$	485	1058
$\langle \hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{a}_{\perp\nu}\hat{\chi}_+\rangle$		373	$\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}\rangle\langle D^\sigma V_{\nu\lambda}\hat{\mathcal{A}}_{\rho\sigma}\rangle$		1059
$\langle \hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{a}_{\perp\mu}\hat{\chi}_+\rangle$	187	374	$\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}\rangle\langle D^\sigma V_{\nu\sigma}\hat{\mathcal{A}}_{\lambda\rho}\rangle$	486	1060
$\langle \hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\rangle\langle \hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle$		375	$\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}\rangle\langle V_{\nu\lambda}D^\sigma\hat{\mathcal{H}}_{\rho\sigma}\rangle$	487	1061
$\langle \hat{a}_\parallel{}^\mu\hat{\chi}_+\rangle\langle \hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_{\parallel\mu}\rangle$	188	376	$\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}\rangle\langle \hat{a}_{\perp\nu}D_\lambda D^\sigma V_{\rho\sigma}\rangle$		1062
$\langle \hat{\chi}_+\rangle\langle \hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\rangle$	189	377	$\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}\rangle\langle \hat{a}_{\perp\nu}D^\sigma D_\sigma V_{\lambda\rho}\rangle$		1063
$\langle \hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\rangle\langle \hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle$		378	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}V_\lambda{}^\sigma V_{\rho\sigma}\rangle+\text{H.c.}$	488	1064
$\langle \hat{a}_\parallel{}^\mu\hat{\chi}_+\rangle\langle \hat{a}_\perp{}^\nu\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$	190	379	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma V_{\nu\lambda}V_{\rho\sigma}\rangle+\text{H.c.}$	489	1065
$\langle \hat{\chi}_+\rangle\langle \hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\rangle$	191	380	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma V_{\nu\sigma}V_{\lambda\rho}\rangle+\text{H.c.}$	490	1066
$\langle \hat{\chi}_+\rangle\langle \hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_{\parallel\mu}\rangle$		381	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}V_{\nu\lambda}\hat{a}_\parallel{}^\sigma V_{\rho\sigma}\rangle+\text{H.c.}$	491	1067
$\langle \hat{a}_\parallel{}^\mu\rangle\langle \hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_{\parallel\mu}\hat{\chi}_+\rangle+\text{H.c.}$		382	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}V_\nu{}^\sigma\hat{a}_{\parallel\lambda}V_{\rho\sigma}\rangle$	492	1068
$\langle \hat{a}_\parallel{}^\mu\rangle\langle \hat{a}_\perp{}^\nu\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle+\text{H.c.}$		383	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_\parallel{}^\sigma\rangle\langle \hat{a}_{\perp\mu}V_{\nu\lambda}V_{\rho\sigma}\rangle+\text{H.c.}$		1069
$\langle \hat{a}_\parallel{}^\mu\rangle\langle \hat{a}_{\perp\mu}\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle+\text{H.c.}$		384	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}\rangle\langle \hat{a}_{\perp\nu}V_\lambda{}^\sigma V_{\rho\sigma}\rangle$		1070
$\langle \hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle \hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{\chi}_+\rangle$		385	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\hat{\chi}_-\rangle+\text{H.c.}$	493	1071
$\langle \hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle \hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{\chi}_+\rangle$		386	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{\chi}_-\hat{a}_{\parallel\rho}\rangle$	494	1072
$\langle \hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\rangle\langle \hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle+\text{H.c.}$		387	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{\chi}_-\rangle+\text{H.c.}$		1073
$\langle \hat{\chi}_+\rangle\langle \hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		388	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\perp\rho}\hat{\chi}_-\rangle$		1074
$\langle \hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle \hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle+\text{H.c.}$		389	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{\chi}_-\rangle\langle \hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\rangle$		1075

Continued on next page

Table A3-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle\hat{\chi}_+\rangle\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle$		390	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{\chi}_-\rangle+\text{H.c.}$		1076
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\mu}\hat{\chi}_+\rangle+\text{H.c.}$		391	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{\chi}_-\rangle+\text{H.c.}$		1077
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_{\perp\mu}\hat{\chi}_+\rangle+\text{H.c.}$		392	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\chi}_-\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\rangle$		1078
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\mu}\hat{a}_{\perp\nu}\hat{\chi}_+\rangle$		393	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{\chi}_-\hat{\mathscr{V}}_{\lambda\rho}\rangle+\text{H.c.}$	495	1079
$\langle\hat{a}_\perp{}^\mu\hat{\chi}_+\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_{\parallel\mu}\rangle+\text{H.c.}$		394	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\mathscr{V}}_{\mu\nu}\rangle\langle\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\hat{\chi}_-\rangle$		1080
$\langle\hat{a}_\perp{}^\mu\hat{\chi}_+\rangle\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\rangle$		395	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_\parallel{}^\sigma\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$	496	1081
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{\chi}_+\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_{\parallel\mu}\rangle$		396	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\lambda}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		1082
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{\chi}_+\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		397	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		1083
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{\chi}_+\rangle$		398	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{\mathscr{H}}_\rho{}^\sigma\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$	497	1084
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{\chi}_+\rangle$		399	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\perp\lambda}\hat{a}_\parallel{}^\sigma\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		1085
$\langle\hat{\chi}_+\rangle\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\rangle$		400	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\lambda}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$	498	1086
$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{\chi}_+\hat{\mathscr{V}}_{\mu\nu}\rangle+\text{H.c.}$	192	401	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		1087
$i\langle\hat{a}_\parallel{}^\mu\hat{\chi}_+\hat{a}_\parallel{}^\nu\hat{\mathscr{V}}_{\mu\nu}\rangle$	193	402	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_\perp{}^\sigma\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		1088
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\hat{\chi}_+\hat{\mathscr{V}}_{\mu\nu}\rangle+\text{H.c.}$	194	403	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_\parallel{}^\sigma\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$	499	1089
$i\langle\hat{\mathscr{V}}_{\mu\nu}\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{\chi}_+\rangle$		404	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\lambda}\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$		1090
$i\langle\hat{\chi}_+\rangle\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{V}}_{\mu\nu}\rangle$		405	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$	500	1091
$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\hat{\chi}_+^2\rangle$	195	406	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$		1092
$\langle\hat{a}_\parallel{}^\mu\hat{\chi}_+\hat{a}_{\parallel\mu}\hat{\chi}_+\rangle$	196	407	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\nu}\hat{a}_{\parallel\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$	501	1093
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\hat{\chi}_+^2\rangle$	197	408	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\sigma}\hat{a}_{\parallel\nu}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$		1094
$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{\chi}_+^2\rangle$	198	409	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{\mathscr{A}}_\rho{}^\sigma\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$	502	1095
$\langle\hat{\chi}_+\rangle\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\hat{\chi}_+\rangle$	199	410	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\nu}\hat{\mathscr{A}}_{\lambda\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1096
$\langle\hat{a}_\parallel{}^\mu\hat{\chi}_+\rangle\langle\hat{a}_{\parallel\mu}\hat{\chi}_+\rangle$	200	411	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\perp\lambda}\hat{a}_\parallel{}^\sigma\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$		1097
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{\chi}_+^2\rangle$		412	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\lambda}\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$	503	1098
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{\chi}_+\rangle\langle\hat{a}_{\parallel\mu}\hat{\chi}_+\rangle$		413	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$	504	1099
$\langle\hat{\chi}_+\rangle\langle\hat{\chi}_+\rangle\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle$		414	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$		1100
$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\hat{\chi}_-^2\rangle$	201	415	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\hat{a}_{\perp\nu}\hat{a}_{\parallel\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$		1101
$\langle\hat{a}_\parallel{}^\mu\hat{\chi}_-\hat{a}_{\parallel\mu}\hat{\chi}_-\rangle$	202	416	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\perp\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$		1102
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\hat{\chi}_-^2\rangle$	203	417	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{\mathscr{H}}_\nu{}^\sigma\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\perp\sigma}\hat{a}_{\parallel\rho}\rangle+\text{H.c.}$	505	1103
$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{\chi}_-^2\rangle$	204	418	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		1104
$\langle\hat{\chi}_-\rangle\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\hat{\chi}_-\rangle$	205	419	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_\parallel{}^\sigma\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		1105
$\langle\hat{a}_\parallel{}^\mu\hat{\chi}_-\rangle\langle\hat{a}_{\parallel\mu}\hat{\chi}_-\rangle$	206	420	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\lambda}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		1106
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{\chi}_-^2\rangle$		421	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_\parallel{}^\sigma\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		1107
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{\chi}_-\rangle\langle\hat{a}_{\parallel\mu}\hat{\chi}_-\rangle$		422	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\lambda}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		1108
$\langle\hat{\chi}_-\rangle\langle\hat{\chi}_-\rangle\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle$		423	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		1109
$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{\chi}_-\hat{\mathscr{H}}_{\mu\nu}\rangle+\text{H.c.}$	207	424	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_\perp{}^\sigma\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		1110

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Table A3-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle\hat{a}_\parallel{}^\mu\hat{\chi}_-\hat{a}_\parallel{}^\nu\hat{\mathscr{H}}_{\mu\nu}\rangle$	208	425	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{\mathscr{H}}_\nu{}^\sigma\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1111
$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{\chi}_-\hat{\mathscr{A}}_{\mu\nu}\rangle+\text{H.c.}$	209	426	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{\mathscr{A}}_\nu^{\sigma}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\perp\sigma}\hat{a}_{\parallel\rho}\rangle+\text{H.c.}$	506	1112
$i\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu D_\nu\hat{\chi}_-\rangle+\text{H.c.}$	210	427	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_{\parallel\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$		1113
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}D_\nu\hat{\chi}_-\rangle+\text{H.c.}$	211	428	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\hat{\mathscr{A}}_{\mu\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\perp\sigma}\hat{a}_{\parallel\rho}\rangle+\text{H.c.}$		1114
$i\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}D^\nu\hat{\chi}_-\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$	212	429	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{\mathscr{A}}_{\nu\lambda}\rangle\langle\hat{a}_{\perp\rho}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1115
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\hat{\chi}_-\hat{\mathscr{H}}_{\mu\nu}\rangle+\text{H.c.}$	213	430	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$		1116
$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{\chi}_-\hat{\mathscr{H}}_{\mu\nu}\rangle$	214	431	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$		1117
$i\langle\hat{\chi}_-\rangle\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{H}}_{\mu\nu}\rangle$		432	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_\parallel{}^\sigma\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$		1118
$i\langle\hat{a}_\parallel{}^\mu\hat{\chi}_-\rangle\langle\hat{a}_\parallel{}^\nu\hat{\mathscr{H}}_{\mu\nu}\rangle$		433	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\sigma}\hat{a}_{\parallel\nu}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$		1119
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\hat{\chi}_-\hat{\mathscr{A}}_{\mu\nu}\rangle+\text{H.c.}$	215	434	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\lambda}\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$		1120
$i\langle\hat{a}_\parallel{}^\mu\hat{\chi}_-\rangle\langle\hat{a}_\parallel{}^\nu\hat{\mathscr{A}}_{\mu\nu}\rangle$		435	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$		1121
$i\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\parallel{}^\nu D_\nu\hat{\chi}_-\rangle$	216	436	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$		1122
$i\langle D^\mu\hat{\chi}_-\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_{\parallel\mu}\rangle+\text{H.c.}$	217	437	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_\parallel{}^\sigma\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$		1123
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\mu}D_\nu\hat{\chi}_-\rangle$	218	438	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$		1124
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}D_\mu\hat{\chi}_-\rangle+\text{H.c.}$		439	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$		1125
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\mu}D_\nu\hat{\chi}_-\rangle+\text{H.c.}$		440	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$		1126
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\nu D_\nu\hat{\chi}_-\rangle+\text{H.c.}$		441	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\perp\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$		1127
$i\langle\hat{a}_\perp{}^\mu D_\mu\hat{\chi}_-\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\rangle$		442	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_\perp{}^\sigma\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$		1128
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\rangle\langle\hat{\chi}_-\hat{\mathscr{H}}_{\mu\nu}\rangle$		443	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\perp\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$		1129
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{\chi}_-\rangle\langle\hat{a}_\parallel{}^\nu\hat{\mathscr{A}}_{\mu\nu}\rangle$		444	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{\mathscr{A}}_\nu^{\sigma}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1130
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle D_\mu\hat{\chi}_-\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\rangle$		445	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\perp{}^\sigma\hat{\mathscr{A}}_{\mu\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1131
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle D^\nu\hat{\chi}_-\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle$		446	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{\mathscr{V}}_\lambda{}^\sigma\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$	507	1132
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle D^\nu\hat{\chi}_-\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\mu}\rangle$		447	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\sigma\hat{\mathscr{V}}_{\nu\lambda}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$	508	1133
$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\hat{\mathscr{H}}^{\nu\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle$	219	448	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{\mathscr{V}}_\lambda{}^\sigma\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$	509	1134
$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{H}}_\mu{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle$	220	449	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\sigma\hat{\mathscr{V}}_{\nu\lambda}\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$	510	1135
$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{H}}_\nu{}^\lambda\hat{\mathscr{H}}_{\mu\lambda}\rangle$	221	450	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\sigma\hat{\mathscr{V}}_{\nu\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$	511	1136
$\langle\hat{a}_\parallel{}^\mu\hat{\mathscr{H}}_\mu{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	222	451	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}D^\sigma\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$	512	1137
$\langle\hat{a}_\parallel{}^\mu\hat{\mathscr{H}}^{\nu\lambda}\hat{a}_{\parallel\mu}\hat{\mathscr{H}}_{\nu\lambda}\rangle$	223	452	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}D_\lambda\hat{\mathscr{V}}_\rho{}^\sigma\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$	513	1138
$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{A}}_\mu{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	224	453	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\parallel\nu}\hat{\mathscr{V}}_\lambda{}^\sigma\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		1139
$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{A}}_\nu{}^\lambda\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$	225	454	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\mathscr{V}}_\mu{}^\sigma\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{\mathscr{H}}_{\rho\sigma}\rangle$		1140
$\langle\hat{a}_\parallel{}^\mu\hat{\mathscr{A}}_\mu{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	226	455	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\parallel\nu}\hat{\mathscr{V}}_\lambda{}^\sigma\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$		1141
$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\hat{\mathscr{A}}^{\nu\lambda}\hat{\mathscr{A}}_{\nu\lambda}\rangle$	227	456	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\parallel{}^\sigma\hat{\mathscr{V}}_{\nu\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$		1142
$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{A}}_\mu{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle$	228	457	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\mathscr{V}}_\mu{}^\sigma\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{\mathscr{A}}_{\rho\sigma}\rangle$		1143
$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{\mathscr{A}}_\nu{}^\lambda\hat{\mathscr{A}}_{\mu\lambda}\rangle$	229	458	$i\varepsilon^{\mu\nu\lambda\rho}\langle D^\sigma\hat{\mathscr{V}}_{\mu\sigma}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\rangle$		1144
$\langle\hat{a}_\parallel{}^\mu\hat{\mathscr{A}}_\mu{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$	230	459	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}D_\lambda\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$		1145

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Table A3-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle\hat{a}_{\parallel}{}^{\mu}\hat{\mathscr{A}}^{\nu\lambda}\hat{a}_{\parallel\mu}\hat{\mathscr{A}}_{\nu\lambda}\rangle$	231	460	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}D^{\sigma}\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$		1146
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel\mu}\hat{a}_{\parallel}{}^{\nu}D^{\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	232	461	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel}{}^{\sigma}D_{\lambda}\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$		1147
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{a}_{\parallel\mu}D^{\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	233	462	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{\chi}_{+}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$	514	1148
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\hat{a}_{\parallel\nu}D^{\lambda}\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$	234	463	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\parallel\nu}\hat{\chi}_{+}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$	515	1149
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel\mu}D^{\nu}\hat{\mathscr{H}}_{\nu}{}^{\lambda}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$	235	464	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{\chi}_{+}\rangle\langle\hat{a}_{\parallel\nu}\hat{\mathscr{A}}_{\lambda\rho}\rangle$		1150
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}D_{\nu}\hat{\mathscr{H}}_{\mu}{}^{\lambda}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$	236	465	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}D_{\rho}\hat{\chi}_{+}\rangle+\text{H.c.}$		1151
$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\parallel\mu}\hat{\mathscr{H}}^{\nu\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle$	237	466	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{\chi}_{+}\rangle\langle\hat{a}_{\parallel\nu}\hat{\mathscr{A}}_{\lambda\rho}\rangle$		1152
$\langle\hat{a}_{\parallel}{}^{\mu}\hat{a}_{\parallel\mu}\rangle\langle\hat{\mathscr{H}}^{\nu\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle$		467	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle D_{\nu}\hat{\chi}_{+}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\rangle$		1153
$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\parallel}{}^{\nu}\hat{\mathscr{H}}_{\mu}{}^{\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	238	468	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\parallel\nu}D_{\lambda}D^{\sigma}\hat{\mathscr{H}}_{\rho\sigma}\rangle$		1154
$\langle\hat{a}_{\parallel}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\rangle\langle\hat{\mathscr{H}}_{\mu}{}^{\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle$		469	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{\chi}_{-}V_{\lambda\rho}\rangle+\text{H.c.}$	516	1155
$\langle\hat{a}_{\parallel}{}^{\mu}\hat{\mathscr{H}}_{\mu}{}^{\nu}\rangle\langle\hat{a}_{\parallel}{}^{\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle$		470	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{\chi}_{-}\hat{a}_{\parallel\nu}V_{\lambda\rho}\rangle$	517	1156
$\langle\hat{a}_{\parallel}{}^{\mu}\hat{\mathscr{H}}^{\nu\lambda}\rangle\langle\hat{a}_{\parallel\mu}\hat{\mathscr{H}}_{\nu\lambda}\rangle$		471	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\parallel\nu}\hat{\chi}_{-}V_{\lambda\rho}\rangle+\text{H.c.}$	518	1157
$\langle\hat{a}_{\parallel}{}^{\mu}\hat{\mathscr{H}}^{\nu\lambda}\rangle\langle\hat{a}_{\parallel\nu}\hat{\mathscr{H}}_{\mu\lambda}\rangle$		472	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\chi}_{-}\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}V_{\lambda\rho}\rangle$		1158
$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\parallel}{}^{\nu}\hat{\mathscr{A}}_{\mu}{}^{\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	239	473	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}V_{\lambda}{}^{\sigma}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$	519	1159
$\langle\hat{a}_{\parallel}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\rangle\langle\hat{\mathscr{A}}_{\mu}{}^{\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle$		474	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel}{}^{\sigma}V_{\nu\lambda}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$	520	1160
$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\parallel}{}^{\nu}\hat{\mathscr{A}}_{\nu}{}^{\lambda}\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$		475	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}V_{\nu\lambda}\hat{a}_{\parallel}{}^{\sigma}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$	521	1161
$\langle\hat{a}_{\parallel}{}^{\mu}\hat{\mathscr{A}}_{\mu}{}^{\nu}\rangle\langle\hat{a}_{\parallel}{}^{\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle$		476	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}V_{\lambda}{}^{\sigma}\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$	522	1162
$\langle\hat{a}_{\parallel}{}^{\mu}\hat{\mathscr{A}}^{\nu\lambda}\rangle\langle\hat{a}_{\parallel\nu}\hat{\mathscr{H}}_{\mu\lambda}\rangle$		477	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel}{}^{\sigma}V_{\nu\lambda}\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$	523	1163
$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\parallel\mu}\hat{\mathscr{A}}^{\nu\lambda}\hat{\mathscr{A}}_{\nu\lambda}\rangle$	240	478	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel}{}^{\sigma}V_{\nu\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$	524	1164
$\langle\hat{a}_{\parallel}{}^{\mu}\hat{a}_{\parallel\mu}\rangle\langle\hat{\mathscr{A}}^{\nu\lambda}\hat{\mathscr{A}}_{\nu\lambda}\rangle$		479	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}V_{\nu\lambda}\hat{a}_{\parallel}{}^{\sigma}\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$	525	1165
$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\parallel}{}^{\nu}\hat{\mathscr{A}}_{\mu}{}^{\lambda}\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$	241	480	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}D^{\sigma}V_{\rho\sigma}\rangle+\text{H.c.}$	526	1166
$\langle\hat{a}_{\parallel}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\rangle\langle\hat{\mathscr{A}}_{\mu}{}^{\lambda}\hat{\mathscr{A}}_{\nu\lambda}\rangle$		481	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel}{}^{\sigma}D_{\lambda}V_{\rho\sigma}\rangle+\text{H.c.}$	527	1167
$\langle\hat{a}_{\parallel}{}^{\mu}\hat{\mathscr{A}}_{\mu}{}^{\nu}\rangle\langle\hat{a}_{\parallel}{}^{\lambda}\hat{\mathscr{A}}_{\nu\lambda}\rangle$		482	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel}{}^{\sigma}D_{\sigma}V_{\lambda\rho}\rangle+\text{H.c.}$	528	1168
$\langle\hat{a}_{\parallel}{}^{\mu}\hat{\mathscr{A}}^{\nu\lambda}\rangle\langle\hat{a}_{\parallel\mu}\hat{\mathscr{A}}_{\nu\lambda}\rangle$		483	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel}{}^{\sigma}\hat{a}_{\parallel\nu}D_{\sigma}V_{\lambda\rho}\rangle+\text{H.c.}$		1169
$\langle\hat{a}_{\parallel}{}^{\mu}\hat{\mathscr{A}}^{\nu\lambda}\rangle\langle\hat{a}_{\parallel\nu}\hat{\mathscr{A}}_{\mu\lambda}\rangle$		484	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}D_{\lambda}V_{\rho}{}^{\sigma}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$	529	1170
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\parallel}{}^{\nu}D^{\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle$	242	485	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}D^{\sigma}V_{\lambda\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$	530	1171
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\rangle\langle\hat{a}_{\parallel\mu}D^{\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle$		486	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\parallel\nu}V_{\lambda}{}^{\sigma}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		1172
$\langle\hat{a}_{\perp}{}^{\mu}\hat{a}_{\parallel}{}^{\nu}\rangle\langle\hat{a}_{\parallel\nu}D^{\lambda}\hat{\mathscr{H}}_{\mu\lambda}\rangle$	243	487	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\parallel}{}^{\sigma}V_{\nu\lambda}\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		1173
$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel\nu}D^{\lambda}\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$		488	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\parallel\nu}V_{\lambda}{}^{\sigma}\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$		1174
$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel}{}^{\lambda}D_{\nu}\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$		489	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\parallel}{}^{\sigma}V_{\nu\lambda}\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$		1175
$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel}{}^{\lambda}D_{\lambda}\hat{\mathscr{H}}_{\mu\nu}\rangle+\text{H.c.}$		490	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\parallel}{}^{\sigma}V_{\nu\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$		1176
$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel}{}^{\lambda}D_{\mu}\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$		491	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel}{}^{\sigma}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}D_{\lambda}V_{\rho\sigma}\rangle+\text{H.c.}$		1177
$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\perp}{}^{\nu}\hat{a}_{\parallel\mu}D^{\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$		492	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel}{}^{\sigma}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}D_{\sigma}V_{\lambda\rho}\rangle+\text{H.c.}$		1178
$\langle\hat{a}_{\parallel}{}^{\mu}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel}{}^{\nu}D^{\lambda}\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$		493	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}D^{\sigma}V_{\rho\sigma}\rangle+\text{H.c.}$		1179

Continued on next page

Table A3-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle \hat{a}_\perp{}^\mu D^\nu \hat{\mathscr{H}}_{\mu\nu}\rangle\langle \hat{a}_\parallel{}^\lambda \hat{a}_{\parallel\lambda}\rangle$		494	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_\parallel{}^\sigma\rangle\langle \hat{a}_{\perp\mu}\hat{a}_{\parallel\sigma} D_\nu V_{\lambda\rho}\rangle + \text{H.c.}$		1180
$\langle \hat{a}_\perp{}^\mu D^\nu \hat{\mathscr{H}}_\nu{}^\lambda\rangle\langle \hat{a}_{\parallel\mu}\hat{a}_{\parallel\lambda}\rangle$		495	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}\rangle\langle \hat{a}_{\perp\nu}\hat{a}_\parallel{}^\sigma D_\lambda V_{\rho\sigma}\rangle + \text{H.c.}$		1181
$i\langle \hat{a}_\parallel{}^\mu \hat{a}_\parallel{}^\nu D_\mu D^\lambda \hat{\mathscr{V}}_{\nu\lambda}\rangle + \text{H.c.}$	244	496	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}\rangle\langle \hat{a}_{\perp\nu}\hat{a}_\parallel{}^\sigma D_\sigma V_{\lambda\rho}\rangle + \text{H.c.}$		1182
$\langle \hat{a}_\parallel{}^\mu \hat{a}_{\parallel\mu} D^\nu D_\nu \hat{\chi}_+\rangle$	245	497	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle + \text{H.c.}$	531	1183
$\langle \hat{a}_\parallel{}^\mu\rangle\langle \hat{a}_{\parallel\mu} D^\nu D_\nu \hat{\chi}_+\rangle$	246	498	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle$		1184
$\langle D^\mu D_\mu \hat{\chi}_+\rangle\langle \hat{a}_\parallel{}^\nu \hat{a}_{\parallel\nu}\rangle$	247	499	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle + \text{H.c.}$	532	1185
$\langle \hat{a}_\parallel{}^\mu\rangle\langle \hat{a}_\parallel{}^\nu D_\mu D_\nu \hat{\chi}_+\rangle$	248	500	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\sigma}\hat{a}_{\parallel\rho}\rangle + \text{H.c.}$	533	1186
$\langle \hat{a}_\parallel{}^\mu\rangle\langle \hat{a}_{\parallel\mu}\rangle\langle D^\nu D_\nu \hat{\chi}_+\rangle$		501	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\sigma}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\rangle + \text{H.c.}$		1187
$\langle \hat{a}_\parallel{}^\mu\rangle\langle \hat{a}_\parallel{}^\nu\rangle\langle D_\mu D_\nu \hat{\chi}_+\rangle$		502	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\hat{a}_{\perp\sigma}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\rangle + \text{H.c.}$	534	1188
$i\langle \hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle + \text{H.c.}$	249	503	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\perp\rho}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle + \text{H.c.}$	535	1189
$i\langle \hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle + \text{H.c.}$	250	504	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle + \text{H.c.}$	536	1190
$i\langle \hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda V_{\mu\lambda}\rangle + \text{H.c.}$	251	505	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\sigma}\hat{a}_{\parallel\rho}\rangle + \text{H.c.}$		1191
$i\langle \hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\mu}V_{\nu\lambda}\rangle + \text{H.c.}$	252	506	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle + \text{H.c.}$	537	1192
$i\langle \hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\nu}V_{\mu\lambda}\rangle + \text{H.c.}$		507	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\perp\lambda}\hat{a}_{\parallel\sigma}\hat{a}_{\parallel\rho}\rangle + \text{H.c.}$		1193
$i\langle \hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}V_{\mu\nu}\rangle + \text{H.c.}$	253	508	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\perp\sigma}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\rangle + \text{H.c.}$		1194
$i\langle \hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\nu V_\nu{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		509	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\nu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle + \text{H.c.}$		1195
$i\langle \hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\mu}V_\nu{}^\lambda\hat{a}_{\parallel\lambda}\rangle + \text{H.c.}$	254	510	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\nu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\sigma}\hat{a}_{\parallel\rho}\rangle + \text{H.c.}$		1196
$i\langle \hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}V_\mu{}^\lambda\hat{a}_{\parallel\lambda}\rangle + \text{H.c.}$		511	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\nu}\hat{a}_{\perp\sigma}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\rangle + \text{H.c.}$		1197
$i\langle \hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda V_{\mu\nu}\hat{a}_{\parallel\lambda}\rangle$	255	512	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\sigma}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\rangle + \text{H.c.}$		1198
$i\langle \hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle + \text{H.c.}$	256	513	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\sigma}\rangle + \text{H.c.}$		1199
$i\langle \hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle + \text{H.c.}$	257	514	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\perp\lambda}\hat{a}_\parallel{}^\sigma\hat{a}_{\perp\rho}\hat{a}_{\parallel\sigma}\rangle$		1200
$i\langle \hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\lambda V_{\mu\lambda}\rangle + \text{H.c.}$	258	515	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\lambda}\hat{a}_{\perp\sigma}\hat{a}_{\parallel\rho}\rangle$		1201
$i\langle \hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}V_{\nu\lambda}\rangle + \text{H.c.}$	259	516	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\rangle\langle \hat{a}_{\parallel\rho}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle$		1202
$i\langle \hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\nu}V_{\mu\lambda}\rangle + \text{H.c.}$	260	517	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle\langle \hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\rangle$		1203
$i\langle \hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}V_{\mu\nu}\rangle + \text{H.c.}$	261	518	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_\parallel{}^\sigma\rangle\langle \hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle + \text{H.c.}$		1204
$i\langle \hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_\perp{}^\lambda V_{\nu\lambda}\rangle + \text{H.c.}$	262	519	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\sigma\rangle\langle \hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_{\perp\rho}\hat{a}_{\parallel\sigma}\rangle$		1205
$i\langle \hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{a}_\perp{}^\lambda V_{\nu\lambda}\rangle + \text{H.c.}$		520	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}\rangle\langle \hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_{\perp\rho}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle$		1206
$i\langle \hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\perp{}^\lambda V_{\mu\lambda}\rangle$	263	521	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\sigma\rangle\langle \hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_{\perp\sigma}\hat{a}_{\parallel\rho}\rangle + \text{H.c.}$		1207
$i\langle \hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\perp\mu}V_{\nu\lambda}\rangle$		522	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_\parallel{}^\sigma\rangle\langle \hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\perp\sigma}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\rangle + \text{H.c.}$		1208
$i\langle \hat{a}_\perp{}^\mu\hat{a}_{\perp\mu}\rangle\langle \hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle$		523	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}\rangle\langle \hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle + \text{H.c.}$		1209
$i\langle \hat{a}_\perp{}^\mu\hat{a}_\perp{}^\nu\rangle\langle \hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle + \text{H.c.}$		524	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}\rangle\langle \hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\sigma}\hat{a}_{\parallel\rho}\rangle + \text{H.c.}$		1210
$i\langle \hat{a}_\parallel{}^\mu V_\mu{}^\nu\rangle\langle \hat{a}_\perp{}^\lambda\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle + \text{H.c.}$		525	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\rangle\langle \hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle + \text{H.c.}$		1211
$i\langle \hat{a}_\parallel{}^\mu V^{\nu\lambda}\rangle\langle \hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle + \text{H.c.}$		526	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\rangle\langle \hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\sigma}\hat{a}_{\parallel\rho}\rangle$		1212
$i\langle \hat{a}_\parallel{}^\mu V^{\nu\lambda}\rangle\langle \hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\mu}\rangle$		527	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\rangle\langle \hat{a}_{\perp\sigma}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\rangle$		1213
$i\langle \hat{a}_\parallel{}^\mu\rangle\langle \hat{a}_\perp{}^\nu\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\lambda V_{\mu\lambda}\rangle + \text{H.c.}$		528	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\parallel\mu}\rangle\langle \hat{a}_{\perp\nu}\hat{a}_\perp{}^\sigma\hat{a}_{\perp\sigma}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\rangle + \text{H.c.}$		1214
$i\langle \hat{a}_\parallel{}^\mu\rangle\langle \hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\nu}V_{\mu\lambda}\rangle + \text{H.c.}$		529	$i\varepsilon^{\mu\nu\lambda\rho}\langle \hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle\langle \hat{a}_{\perp\rho}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle$		1215

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Table A3-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}V_{\mu\nu}\rangle+\text{H.c.}$		530	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\perp\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1216
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}V_{\nu\lambda}\rangle+\text{H.c.}$		531	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle\langle\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1217
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle+\text{H.c.}$		532	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1218
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\perp\mu}\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle+\text{H.c.}$		533	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_\parallel{}^\sigma\hat{a}_{\perp\rho}\hat{a}_{\parallel\sigma}\rangle$		1219
$i\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\perp{}^\lambda V_{\nu\lambda}\rangle$		534	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1220
$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\perp\mu}V_{\nu\lambda}\rangle+\text{H.c.}$		535	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\perp\sigma}\hat{a}_{\parallel\nu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\rangle+\text{H.c.}$		1221
$i\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle+\text{H.c.}$		536	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\lambda}\hat{a}_{\perp\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1222
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}V_{\nu\lambda}\rangle+\text{H.c.}$		537	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\perp\sigma}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\rangle+\text{H.c.}$		1223
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\nu}V_{\mu\lambda}\rangle+\text{H.c.}$		538	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\lambda}\hat{a}_{\perp\sigma}\hat{a}_{\parallel\rho}\rangle+\text{H.c.}$		1224
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\perp{}^\lambda V_{\mu\lambda}\rangle+\text{H.c.}$		539	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1225
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\perp\mu}V_{\nu\lambda}\rangle+\text{H.c.}$		540	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1226
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\mu}\hat{a}_\perp{}^\lambda V_{\nu\lambda}\rangle$		541	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{a}_\perp{}^\sigma\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1227
$i\langle\hat{a}_\perp{}^\mu V_\mu{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		542	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_\parallel{}^\sigma\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$	538	1228
$i\langle\hat{a}_\perp{}^\mu V^{\nu\lambda}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		543	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\lambda}\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$	539	1229
$i\langle\hat{a}_\perp{}^\mu V^{\nu\lambda}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\mu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		544	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\hat{\mathscr{V}}_{\lambda\rho}\rangle+\text{H.c.}$	540	1230
$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}V^{\nu\lambda}\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	264	545	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$	541	1231
$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu V_\mu{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	265	546	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\nu}\hat{a}_{\parallel\sigma}\hat{\mathscr{V}}_{\lambda\rho}\rangle+\text{H.c.}$	542	1232
$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu V_\nu{}^\lambda\hat{\mathscr{V}}_{\mu\lambda}\rangle+\text{H.c.}$	266	547	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\hat{a}_{\parallel\nu}\hat{\mathscr{V}}_{\lambda\rho}\rangle+\text{H.c.}$		1233
$\langle\hat{a}_\parallel{}^\mu V_\mu{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	267	548	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{\mathscr{V}}_\rho{}^\sigma\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1234
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}V^{\nu\lambda}\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	268	549	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\sigma\hat{\mathscr{V}}_{\lambda\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$	543	1235
$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle V^{\nu\lambda}\hat{\mathscr{V}}_{\nu\lambda}\rangle$	269	550	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\parallel\lambda}\hat{a}_\parallel{}^\sigma\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$	544	1236
$\langle\hat{\mathscr{V}}^{\mu\nu}\rangle\langle\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}V_{\mu\nu}\rangle$	270	551	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\mathscr{V}}_\mu{}^\sigma\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1237
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu V_\mu{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	271	552	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{\mathscr{V}}_\nu{}^\sigma\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$	545	1238
$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle V_\mu{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$	272	553	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\hat{\mathscr{V}}_{\lambda\rho}\rangle$	546	1239
$\langle\hat{\mathscr{V}}^{\mu\nu}\rangle\langle\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\mu}V_{\nu\lambda}\rangle+\text{H.c.}$	273	554	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\hat{\mathscr{V}}_{\mu\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$	547	1240
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu V_\nu{}^\lambda\hat{\mathscr{V}}_{\mu\lambda}\rangle+\text{H.c.}$	274	555	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\mathscr{V}}_{\mu\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$	548	1241
$\langle\hat{a}_\parallel{}^\mu V_\mu{}^\nu\rangle\langle\hat{a}_\parallel{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$	275	556	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_{\parallel\sigma}\hat{\mathscr{V}}_{\lambda\rho}\rangle+\text{H.c.}$	549	1242
$\langle\hat{a}_\parallel{}^\mu V^{\nu\lambda}\rangle\langle\hat{a}_{\parallel\mu}\hat{\mathscr{V}}_{\nu\lambda}\rangle$	276	557	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\mathscr{V}}_{\mu\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle$		1243
$\langle\hat{a}_\parallel{}^\mu V^{\nu\lambda}\rangle\langle\hat{a}_{\parallel\nu}\hat{\mathscr{V}}_{\mu\lambda}\rangle$	277	558	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{\mathscr{V}}_{\nu\lambda}\rangle\langle\hat{a}_{\perp\rho}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle$	550	1244
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\rangle\langle V^{\nu\lambda}\hat{\mathscr{V}}_{\nu\lambda}\rangle$		559	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$		1245
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{\mathscr{V}}^{\nu\lambda}\rangle\langle\hat{a}_{\parallel\mu}V_{\nu\lambda}\rangle$		560	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\sigma}\hat{\mathscr{V}}_{\lambda\rho}\rangle+\text{H.c.}$		1246
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\rangle\langle V_\mu{}^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$		561	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_\parallel{}^\sigma\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$		1247
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{\mathscr{V}}^{\nu\lambda}\rangle\langle\hat{a}_{\parallel\nu}V_{\mu\lambda}\rangle$		562	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\lambda}\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$		1248
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{\mathscr{V}}_\mu{}^\nu\rangle\langle\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle$		563	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\hat{\mathscr{V}}_{\lambda\rho}\rangle+\text{H.c.}$		1249
$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{\chi}_+V_{\mu\nu}\rangle+\text{H.c.}$	278	564	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{\mathscr{V}}_{\lambda\rho}\rangle+\text{H.c.}$		1250

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Table A3-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle\hat{a}_\parallel{}^\mu\hat{\chi}_+\hat{a}_\parallel{}^\nu V_{\mu\nu}\rangle$	279	565	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{\mathscr{V}}_{\rho\sigma}\rangle+\text{H.c.}$		1251
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\hat{\chi}_+V_{\mu\nu}\rangle+\text{H.c.}$	280	566	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{\mathscr{V}}_\rho{}^\sigma\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1252
$i\langle\hat{\chi}_+\rangle\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu V_{\mu\nu}\rangle$		567	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\sigma}\hat{\mathscr{V}}_{\lambda\rho}\rangle+\text{H.c.}$		1253
$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu D_\mu D^\lambda V_{\nu\lambda}\rangle+\text{H.c.}$	281	568	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{\mathscr{V}}_{\nu\lambda}\rangle\langle\hat{a}_{\parallel\rho}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle$		1254
$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}V^{\nu\lambda}V_{\nu\lambda}\rangle$	282	569	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle\langle\hat{a}_\parallel{}^\sigma\hat{\mathscr{V}}_{\rho\sigma}\rangle$		1255
$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu V_\mu{}^\lambda V_{\nu\lambda}\rangle$	283	570	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\mathscr{V}}_\mu{}^\sigma\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle\langle\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle$		1256
$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu V_\nu{}^\lambda V_{\mu\lambda}\rangle$	284	571	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\parallel\lambda}\hat{\mathscr{V}}_{\rho\sigma}\rangle$		1257
$\langle\hat{a}_\parallel{}^\mu V_\mu{}^\nu\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle+\text{H.c.}$	285	572	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{\mathscr{V}}_\nu{}^\sigma\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1258
$\langle\hat{a}_\parallel{}^\mu V^{\nu\lambda}\hat{a}_{\parallel\mu}V_{\nu\lambda}\rangle$	286	573	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\parallel\sigma}\hat{\mathscr{V}}_{\lambda\rho}\rangle$		1259
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}V^{\nu\lambda}V_{\nu\lambda}\rangle$	287	574	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\mathscr{V}}_{\mu\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\rangle\langle\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle$		1260
$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle V^{\nu\lambda}V_{\nu\lambda}\rangle$	288	575	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{\mathscr{V}}_{\mu\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1261
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu V_\mu{}^\lambda V_{\nu\lambda}\rangle+\text{H.c.}$	289	576	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\parallel\lambda}\hat{\mathscr{V}}_{\rho\sigma}\rangle$		1262
$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle V_\mu{}^\lambda V_{\nu\lambda}\rangle$	290	577	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\parallel\sigma}\hat{\mathscr{V}}_{\lambda\rho}\rangle$		1263
$\langle\hat{a}_\parallel{}^\mu V_\mu{}^\nu\rangle\langle\hat{a}_\parallel{}^\lambda V_{\nu\lambda}\rangle$	291	578	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\mathscr{V}}_{\mu\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle$		1264
$\langle\hat{a}_\parallel{}^\mu V^{\nu\lambda}\rangle\langle\hat{a}_{\parallel\mu}V_{\nu\lambda}\rangle$	292	579	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\sigma}\rangle\langle\hat{a}_{\parallel\nu}\hat{\mathscr{V}}_{\lambda\rho}\rangle$		1265
$\langle\hat{a}_\parallel{}^\mu V^{\nu\lambda}\rangle\langle\hat{a}_{\parallel\nu}V_{\mu\lambda}\rangle$	293	580	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{\mathscr{V}}_{\nu\lambda}\rangle\langle\hat{a}_{\perp\rho}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle$		1266
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\rangle\langle V^{\nu\lambda}V_{\nu\lambda}\rangle$		581	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\hat{\chi}_+\rangle+\text{H.c.}$	551	1267
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\rangle\langle V_\mu{}^\lambda V_{\nu\lambda}\rangle$		582	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{\chi}_+\hat{a}_{\parallel\rho}\rangle+\text{H.c.}$	552	1268
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{\chi}_-\rangle+\text{H.c.}$	294	583	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\hat{\chi}_+\rangle$		1269
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{\chi}_-\rangle+\text{H.c.}$	295	584	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{\chi}_+\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\rangle$		1270
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{a}_{\parallel\mu}\hat{\chi}_-\rangle+\text{H.c.}$	296	585	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{\chi}_+\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\rangle$		1271
$\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{\chi}_-\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$	297	586	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\hat{\chi}_+\rangle+\text{H.c.}$		1272
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{\chi}_-\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$	298	587	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{\chi}_+\hat{a}_{\parallel\rho}\rangle$		1273
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{\chi}_-\hat{a}_{\parallel\mu}\rangle+\text{H.c.}$	299	588	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{\chi}_+\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\rangle$		1274
$\langle\hat{a}_\parallel{}^\mu\hat{\chi}_-\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_{\parallel\mu}\rangle+\text{H.c.}$		589	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}D_\rho\hat{\chi}_-\rangle$		1275
$\langle\hat{\chi}_-\rangle\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		590	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}D^\sigma\hat{\mathscr{H}}_{\rho\sigma}\rangle$	553	1276
$\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{\chi}_-\rangle+\text{H.c.}$		591	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\sigma D_\lambda\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$	554	1277
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_{\parallel\mu}\hat{\chi}_-\rangle+\text{H.c.}$		592	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}D^\sigma\hat{\mathscr{H}}_{\rho\sigma}\rangle$		1278
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{\chi}_-\rangle+\text{H.c.}$		593	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\sigma D_\lambda\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		1279
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{\chi}_-\rangle+\text{H.c.}$		594	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_\parallel{}^\sigma V_{\rho\sigma}\rangle+\text{H.c.}$	555	1280
$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{\chi}_-\rangle+\text{H.c.}$		595	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\lambda}V_{\rho\sigma}\rangle+\text{H.c.}$	556	1281
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{\chi}_-\hat{a}_{\parallel\mu}\rangle+\text{H.c.}$		596	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}V_{\lambda\rho}\rangle+\text{H.c.}$	557	1282
$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{\chi}_-\rangle+\text{H.c.}$		597	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}V_{\rho\sigma}\rangle+\text{H.c.}$	558	1283
$i\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	300	598	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\nu}\hat{a}_{\parallel\sigma}V_{\lambda\rho}\rangle+\text{H.c.}$	559	1284
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$	301	599	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\hat{a}_{\parallel\nu}V_{\lambda\rho}\rangle+\text{H.c.}$	560	1285
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$	302	600	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}V_\rho{}^\sigma\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1286

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Table A3-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\mu}\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$		601	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\sigma V_{\lambda\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$	561	1287
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\nu}\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$	303	602	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\sigma V_{\lambda\sigma}\hat{a}_{\parallel\rho}\rangle+\text{H.c.}$	562	1288
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\hat{\mathscr{H}}_{\mu\nu}\rangle+\text{H.c.}$		603	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\nu}V_{\lambda\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1289
$i\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{\mathscr{H}}_\nu{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$	304	604	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\nu}V_{\lambda\sigma}\hat{a}_{\parallel\rho}\rangle+\text{H.c.}$		1290
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{\mathscr{H}}_\nu{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$	305	605	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}V_{\nu\lambda}\hat{a}_{\parallel\rho}\rangle+\text{H.c.}$	563	1291
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{\mathscr{H}}_\mu{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$	306	606	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\parallel\lambda}\hat{a}_\parallel{}^\sigma V_{\rho\sigma}\rangle+\text{H.c.}$	564	1292
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\mu\nu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$	307	607	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}V_\nu{}^\sigma\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$	565	1293
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\mu\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$	308	608	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}V_{\lambda\rho}\rangle$	566	1294
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\hat{a}_{\parallel\mu}\rangle+\text{H.c.}$	309	609	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma V_{\mu\nu}\rangle\langle\hat{a}_{\perp\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$	567	1295
$i\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$	310	610	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_{\parallel\sigma}V_{\lambda\rho}\rangle+\text{H.c.}$	568	1296
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$	311	611	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}V_{\nu\lambda}\rangle\langle\hat{a}_{\perp\rho}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle$	569	1297
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\mu\lambda}\rangle+\text{H.c.}$	312	612	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}V_{\rho\sigma}\rangle+\text{H.c.}$		1298
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$		613	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\sigma}V_{\lambda\rho}\rangle+\text{H.c.}$		1299
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\nu}\hat{\mathscr{A}}_{\mu\lambda}\rangle+\text{H.c.}$	313	614	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_\parallel{}^\sigma V_{\rho\sigma}\rangle+\text{H.c.}$		1300
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\hat{\mathscr{A}}_{\mu\nu}\rangle+\text{H.c.}$		615	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\sigma}\hat{a}_{\parallel\nu}V_{\lambda\rho}\rangle+\text{H.c.}$		1301
$i\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu\hat{\mathscr{A}}_\nu{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$	314	616	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\lambda}V_{\rho\sigma}\rangle+\text{H.c.}$		1302
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}\hat{\mathscr{A}}_\nu{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$	315	617	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}V_{\lambda\rho}\rangle+\text{H.c.}$		1303
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}\hat{\mathscr{A}}_\mu{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$	316	618	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}V_{\lambda\rho}\rangle+\text{H.c.}$		1304
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\mu\nu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$	317	619	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}V_{\lambda\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1305
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\mu\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$	318	620	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}V_{\rho\sigma}\rangle+\text{H.c.}$		1306
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\hat{a}_{\parallel\mu}\rangle+\text{H.c.}$		621	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}V_\rho{}^\sigma\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1307
$i\langle\hat{a}_\parallel{}^\mu\hat{\mathscr{H}}_\mu{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		622	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\sigma}V_{\lambda\rho}\rangle+\text{H.c.}$		1308
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$		623	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\sigma V_{\lambda\rho}\hat{a}_{\parallel\sigma}\rangle$		1309
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$		624	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}V_{\nu\lambda}\rangle\langle\hat{a}_{\parallel\rho}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle$	570	1310
$i\langle\hat{a}_\parallel{}^\mu\hat{\mathscr{H}}^{\nu\lambda}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\mu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		625	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\rangle\langle\hat{a}_\parallel{}^\sigma V_{\rho\sigma}\rangle$		1311
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\mu\lambda}\rangle+\text{H.c.}$		626	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\parallel\lambda}V_{\rho\sigma}\rangle$		1312
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\hat{\mathscr{H}}_{\mu\nu}\rangle+\text{H.c.}$		627	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\parallel\sigma}V_{\lambda\rho}\rangle$		1313
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\mu}\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$		628	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\parallel\lambda}V_{\rho\sigma}\rangle$		1314
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$		629	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\parallel\sigma}V_{\lambda\rho}\rangle$		1315
$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\hat{\mathscr{H}}_{\mu\nu}\rangle+\text{H.c.}$		630	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\sigma}\rangle\langle\hat{a}_{\parallel\nu}V_{\lambda\rho}\rangle$		1316
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{\mathscr{H}}_\mu{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		631	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}V_{\lambda\rho}\rangle\langle\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle$		1317
$i\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$		632	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}V_{\nu\lambda}\rangle\langle\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle$		1318
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\hat{a}_{\parallel\mu}\rangle+\text{H.c.}$		633	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}V_\lambda{}^\sigma\rangle\langle\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle$		1319
$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$		634	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\hat{\chi}_-\rangle$		1320
$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{H}}_{\nu\lambda}\rangle+\text{H.c.}$		635	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_\parallel{}^\sigma\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$	571	1321

Continued on next page

Table A3-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$i\langle\hat{a}_\perp{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle$		636	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_\parallel{}^\sigma\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$	572	1322
$i\langle\hat{a}_\parallel{}^\mu\hat{\mathscr{A}}_\mu{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\nu}\rangle+\text{H.c.}$		637	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$	573	1323
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$		638	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_\parallel{}^\sigma\hat{\mathscr{H}}_{\rho\sigma}\rangle+\text{H.c.}$		1324
$i\langle\hat{a}_\perp{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\mu\lambda}\rangle+\text{H.c.}$		639	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_\parallel{}^\sigma\hat{\mathscr{A}}_{\rho\sigma}\rangle+\text{H.c.}$		1325
$i\langle\hat{a}_\parallel{}^\mu\hat{\mathscr{A}}^{\nu\lambda}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		640	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$	574	1326
$i\langle\hat{a}_\parallel{}^\mu\hat{\mathscr{A}}^{\nu\lambda}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\mu}\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		641	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\nu}\hat{a}_{\parallel\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle$		1327
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\mu\lambda}\rangle+\text{H.c.}$		642	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_{\parallel\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$	575	1328
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\nu}\hat{\mathscr{A}}_{\mu\lambda}\rangle+\text{H.c.}$		643	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{\mathscr{A}}_{\nu\lambda}\rangle\langle\hat{a}_{\parallel\rho}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle$		1329
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\hat{\mathscr{A}}_{\mu\nu}\rangle+\text{H.c.}$		644	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\parallel\lambda}\hat{\mathscr{H}}_{\rho\sigma}\rangle$		1330
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\mu}\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$		645	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\parallel\lambda}\hat{\mathscr{A}}_{\rho\sigma}\rangle$		1331
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_{\parallel\nu}\hat{\mathscr{A}}_\mu{}^\lambda\hat{a}_{\parallel\lambda}\rangle+\text{H.c.}$		646	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\parallel\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle$		1332
$i\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$		647	$\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_{\parallel\sigma}\hat{\mathscr{A}}_{\lambda\rho}\rangle+\text{H.c.}$		1333
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\perp{}^\nu\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\hat{a}_{\parallel\mu}\rangle+\text{H.c.}$		648	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$	576	1334
$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_\perp{}^\lambda\hat{a}_{\parallel\mu}\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$		649	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$	577	1335
$i\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\lambda\hat{\mathscr{A}}_{\nu\lambda}\rangle+\text{H.c.}$		650	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\hat{a}_{\parallel\rho}\rangle+\text{H.c.}$		1336
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\nu\hat{\mathscr{A}}_\nu{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		651	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$	578	1337
$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu D^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	319	652	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\sigma}\hat{a}_{\parallel\rho}\rangle$	579	1338
$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\mu}D^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$	320	653	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle$		1339
$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda D_\mu\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	321	654	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle$		1340
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu D^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle+\text{H.c.}$	322	655	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle\langle\hat{a}_{\parallel\rho}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle$		1341
$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\parallel{}^\nu D^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$	323	656	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\rangle$		1342
$\langle D^\mu\hat{\mathscr{V}}_\mu{}^\nu\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$	324	657	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1343
$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\mu}D^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$	325	658	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1344
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_{\parallel\nu}D^\lambda\hat{\mathscr{V}}_{\mu\lambda}\rangle$	326	659	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\sigma}\hat{a}_{\parallel\rho}\rangle+\text{H.c.}$		1345
$\langle\hat{a}_\parallel{}^\mu\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_\parallel{}^\lambda D_\mu\hat{\mathscr{V}}_{\nu\lambda}\rangle$	327	660	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1346
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\hat{a}_\parallel{}^\lambda D_\nu\hat{\mathscr{V}}_{\mu\lambda}\rangle+\text{H.c.}$	328	661	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1347
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_\parallel{}^\nu D^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$		662	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\sigma}\hat{a}_{\parallel\rho}\rangle$		1348
$\langle\hat{a}_\parallel{}^\mu\rangle\langle D^\nu\hat{\mathscr{V}}_\nu{}^\lambda\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_{\parallel\lambda}\rangle$		663	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle+\text{H.c.}$		1349
$\langle\hat{a}_\parallel{}^\mu\rangle\langle D^\nu\hat{\mathscr{V}}_{\mu\nu}\rangle\langle\hat{a}_\parallel{}^\lambda\hat{a}_{\parallel\lambda}\rangle$		664	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\parallel\lambda}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\hat{a}_{\parallel\rho}\rangle$		1350
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_{\parallel\mu}D^\lambda\hat{\mathscr{V}}_{\nu\lambda}\rangle$		665	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle$		1351
$\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_\parallel{}^\nu\rangle\langle\hat{a}_\parallel{}^\lambda D_\mu\hat{\mathscr{V}}_{\nu\lambda}\rangle$		666	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\parallel\mu}\rangle\langle\hat{a}_{\perp\nu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle$		1352
$\langle\hat{a}_\parallel{}^\mu\rangle\langle D^\nu\hat{\mathscr{V}}_\mu{}^\lambda\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\rangle$		667	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_{\perp\mu}\hat{a}_\parallel{}^\sigma\hat{a}_{\parallel\sigma}\rangle\langle\hat{a}_{\parallel\nu}\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\rangle$		1353
$i\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu D_\nu\hat{\chi}_+\rangle+\text{H.c.}$	329	668	$i\varepsilon^{\mu\nu\lambda\rho}\langle\hat{a}_\parallel{}^\sigma\rangle\langle\hat{a}_{\perp\mu}\hat{a}_{\parallel\nu}\rangle\langle\hat{a}_{\parallel\lambda}\hat{a}_{\parallel\rho}\hat{a}_{\parallel\sigma}\rangle$		1354
$i\langle\hat{a}_\parallel{}^\mu\rangle\langle\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu D_\nu\hat{\chi}_+\rangle+\text{H.c.}$		669	$\varepsilon^{\mu\nu\lambda\rho}\langle H_\mu{}^\sigma\rangle\langle\hat{a}_{\perp\nu}\hat{a}_{\perp\lambda}\hat{a}_{\perp\sigma}\hat{a}_{\parallel\rho}\rangle+\text{H.c.}$		1355
$\langle\hat{a}_\parallel{}^\mu\hat{a}_{\parallel\mu}\hat{a}_\parallel{}^\nu D^\lambda V_{\nu\lambda}\rangle+\text{H.c.}$	330	670	$\varepsilon^{\mu\nu\lambda\rho}\langle D_\mu H_\nu{}^\sigma\rangle\langle\hat{a}_{\parallel\lambda}\hat{\mathscr{H}}_{\rho\sigma}\rangle$		1356

Continued on next page

Table A3-continued from previous page

P_n	$SU(2)$	$SU(3)$	P_n	$SU(2)$	$SU(3)$
$\langle \hat{a}_\parallel{}^\mu \hat{a}_\parallel{}^\nu \hat{a}_{\parallel\mu} D^\lambda V_{\nu\lambda} \rangle$	331	671	$i\varepsilon^{\mu\nu\lambda\rho} \langle H_\mu{}^\sigma \rangle \langle \hat{a}_{\perp\nu} \hat{a}_{\parallel\lambda} V_{\rho\sigma} \rangle + \text{H.c.}$		1357
$\langle \hat{a}_\parallel{}^\mu \hat{a}_\parallel{}^\nu \hat{a}_\parallel{}^\lambda D_\mu V_{\nu\lambda} \rangle + \text{H.c.}$	332	672	$i\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\parallel\mu} \rangle \langle \hat{a}_{\parallel\nu} H_\lambda{}^\sigma \hat{\mathscr{H}}_{\rho\sigma} \rangle + \text{H.c.}$		1358
$\langle \hat{a}_\parallel{}^\mu \rangle \langle \hat{a}_{\parallel\mu} \hat{a}_\parallel{}^\nu D^\lambda V_{\nu\lambda} \rangle + \text{H.c.}$	333	673	$i\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\parallel\mu} \rangle \langle \hat{a}_{\parallel\nu} H_\lambda{}^\sigma \hat{\mathscr{A}}_{\rho\sigma} \rangle + \text{H.c.}$		1359
$\langle \hat{a}_\parallel{}^\mu \hat{a}_{\parallel\mu} \rangle \langle \hat{a}_\parallel{}^\nu D^\lambda V_{\nu\lambda} \rangle$	334	674	$i\varepsilon^{\mu\nu\lambda\rho} \langle D^\sigma H_{\mu\sigma} \rangle \langle \hat{a}_{\perp\nu} \hat{a}_{\parallel\lambda} \hat{a}_{\parallel\rho} \rangle$		1360
$\langle \hat{a}_\parallel{}^\mu \hat{a}_\parallel{}^\nu \rangle \langle \hat{a}_{\parallel\mu} D^\lambda V_{\nu\lambda} \rangle$	335	675	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_{\parallel\nu} \hat{a}_{\parallel\lambda} \hat{a}_\parallel{}^\sigma H_{\rho\sigma} \rangle + \text{H.c.}$		1361
$\langle \hat{a}_\parallel{}^\mu \rangle \langle \hat{a}_\parallel{}^\nu \hat{a}_{\parallel\nu} D^\lambda V_{\mu\lambda} \rangle$	336	676	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\perp\mu} \hat{a}_{\parallel\nu} \hat{a}_\parallel{}^\sigma \hat{a}_{\parallel\lambda} H_{\rho\sigma} \rangle + \text{H.c.}$	580	1362
$\langle \hat{a}_\parallel{}^\mu \hat{a}_\parallel{}^\nu \rangle \langle \hat{a}_\parallel{}^\lambda D_\mu V_{\nu\lambda} \rangle$	337	677	$\varepsilon^{\mu\nu\lambda\rho} \langle H_\mu{}^\sigma \rangle \langle \hat{a}_{\perp\nu} \hat{a}_{\parallel\lambda} \hat{a}_{\parallel\rho} \hat{a}_{\parallel\sigma} \rangle + \text{H.c.}$		1363
$\langle \hat{a}_\parallel{}^\mu \rangle \langle \hat{a}_\parallel{}^\nu \hat{a}_\parallel{}^\lambda D_\nu V_{\mu\lambda} \rangle + \text{H.c.}$	338	678	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\parallel\mu} H_\nu{}^\sigma \rangle \langle \hat{a}_{\perp\lambda} \hat{a}_{\parallel\rho} \hat{a}_{\parallel\sigma} \rangle + \text{H.c.}$		1364
$\langle \hat{a}_\parallel{}^\mu \rangle \langle \hat{a}_{\parallel\mu} \rangle \langle \hat{a}_\parallel{}^\nu D^\lambda V_{\nu\lambda} \rangle$		679	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_\parallel{}^\sigma \rangle \langle \hat{a}_{\perp\mu} \hat{a}_{\parallel\nu} \hat{a}_{\parallel\lambda} H_{\rho\sigma} \rangle + \text{H.c.}$		1365
$\langle \hat{a}_\parallel{}^\mu \rangle \langle \hat{a}_\parallel{}^\nu \rangle \langle \hat{a}_{\parallel\mu} D^\lambda V_{\nu\lambda} \rangle$		680	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\parallel\mu} \rangle \langle \hat{a}_{\perp\nu} \hat{a}_{\parallel\lambda} \hat{a}_\parallel{}^\sigma H_{\rho\sigma} \rangle + \text{H.c.}$		1366
$\langle \hat{a}_\parallel{}^\mu \rangle \langle \hat{a}_\parallel{}^\nu \rangle \langle \hat{a}_\parallel{}^\lambda D_\mu V_{\nu\lambda} \rangle$		681	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\parallel\mu} \rangle \langle \hat{a}_{\perp\nu} \hat{a}_\parallel{}^\sigma \hat{a}_{\parallel\lambda} H_{\rho\sigma} \rangle + \text{H.c.}$		1367
$\langle \hat{a}_\perp{}^\mu \hat{a}_{\perp\mu} \hat{a}_\parallel{}^\nu \hat{a}_{\parallel\nu} \hat{a}_\parallel{}^\lambda \hat{a}_{\parallel\lambda} \rangle$	339	682	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\parallel\mu} \rangle \langle \hat{a}_{\perp\nu} \hat{a}_{\parallel\lambda} \rangle \langle \hat{a}_\parallel{}^\sigma H_{\rho\sigma} \rangle$		1368
$\langle \hat{a}_\perp{}^\mu \hat{a}_{\perp\mu} \hat{a}_\parallel{}^\nu \hat{a}_\parallel{}^\lambda \hat{a}_{\parallel\nu} \hat{a}_{\parallel\lambda} \rangle$	340	683	$\varepsilon^{\mu\nu\lambda\rho} \langle H_\mu{}^\sigma \rangle \langle \hat{a}_{\perp\nu} \hat{a}_{\parallel\lambda} \rangle \langle \hat{a}_{\parallel\rho} \hat{a}_{\parallel\sigma} \rangle$		1369
$\langle \hat{a}_\perp{}^\mu \hat{a}_{\perp\mu} \hat{a}_\parallel{}^\nu \hat{a}_\parallel{}^\lambda \hat{a}_{\parallel\lambda} \hat{a}_{\parallel\nu} \rangle$		684	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_\parallel{}^\sigma \rangle \langle \hat{a}_{\perp\mu} \hat{a}_{\parallel\nu} \rangle \langle \hat{a}_{\parallel\lambda} H_{\rho\sigma} \rangle$		1370
$\langle \hat{a}_\perp{}^\mu \hat{a}_\perp{}^\nu \hat{a}_{\parallel\mu} \hat{a}_{\parallel\nu} \hat{a}_\parallel{}^\lambda \hat{a}_{\parallel\lambda} \rangle + \text{H.c.}$	341	685	$\varepsilon^{\mu\nu\lambda\rho} \langle \hat{a}_{\parallel\mu} \rangle \langle \hat{a}_{\perp\nu} \hat{a}_\parallel{}^\sigma \rangle \langle \hat{a}_{\parallel\lambda} H_{\rho\sigma} \rangle$		1371
$\langle \hat{a}_\perp{}^\mu \hat{a}_\perp{}^\nu \hat{a}_{\parallel\mu} \hat{a}_\parallel{}^\lambda \hat{a}_{\parallel\nu} \hat{a}_{\parallel\lambda} \rangle + \text{H.c.}$	342	686			

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