Addendum: ***Quark Confinement, New Cosmic Expansion and General Yang-Mills Symmetry*** **(J. P. Hsu, Chin. Phys. C, 41(1): 015101 (2017))**

The force between a gigantic sphere with baryon galaxies exerted on an idealized point-like supernova is given by $F_{cbf} \equiv F_I$ in Eq. (40) of the original paper. We can generalized the point-like supernova to a sphere with a radius R_s and a constant mass density ρ_s. Similar to the previous calculations, the modified effective force between the gigantic sphere and a supernova sphere is found to be

$$F_{cbf} = \left(\frac{(3g_b)^2 mM}{8\pi L_s^2 m_p^2}\right)\left[\frac{r}{R_o} - \frac{r^3}{5R_o^3} - \frac{rR_s^3}{5R_o^3}\right] \equiv F_{II}, \quad (1)$$

where $m = 4\pi R_s^3 \rho_s/3$. In this calculation, one can consider the total baryon charge of the gigantic sphere to be concentrated at the center of the sphere, as indicated by the result of the previous calculation. As we expected, this effective force (1) reduces to that in Eq. (40) of the paper in the limit $R_s \to 0$.

Suppose we use $F_c = constant$ to denote the r-independent force for two point-like baryonic charges. Our results show that there is a qualitative difference between F_c and F_{II} in (1). However, there is no qualitative difference between F_{II} and F_I.

This new r-dependent 'Okubo force' (1) for two big baryonic systems is the logical result of the generalization of the original Lee-Yang U_1 gauge symmetry for conserved baryonic charges [1]. Such a 'Lee-Yang symmetry' is associated with the usual baryonic gauge field and the inverse-square baryonic force. Based on Eötvös experiment, they estimated that their baryonic force is about 10^{-5} times weaker than the gravitational force. Thus, both the 'Lee-Yang baryonic force' and the 'Okubo force' (as estimated in Eq. (42) of the paper) are extremely weak in comparison with the gravitational force.

References

1 T. D. Lee and C. N. Yang, Phys. Rev., **98**: 1501 (1955)