THE NEUTRON STARS WITH MAGNETIC CHARGES

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From KNK metric, we have shown that there may exist some kind of celestial bodies which can not collapse to black holes provided that the proportion of the content of the magnetic monopoles to the nuclei $\xi = N_m/N_B$ exceeds a critical value $\xi_c(1-a^2/R_g^2)$,in which $\xi_c = \sqrt{G}\, m_B/g_m \sim 4.4 \times 10^{21}$, $a = J/Mc$, $R_g = GM/c^2$.

The main results are given below:

a. If the content of magnetic monopoles in celestial bodies is so high that $\chi \equiv \xi/\xi_c > 1$ which is possible for supermassive celestial bodies, no horizon of black holes will appear for the heavily collapsing bodies. Around the celestial body, the force from KNK metric becomes much strong. In the region $R \leqq r \leqq a$, any particle will be repulsed by the central body, which means that no collapse will happen. Because of the RC effect of the magnetic monoples, there may not exist a central singularity. This kind of celestial bodies will be the neutron stars rather than black holes.

b. Because of the coupling between the angular momentum of the central body and that of particles, some sort of latitudinal forces will be produced. Under the combining effect of F_ϑ and F_φ , most of particles on the surface of celestial body including magnetic monoples will move to the polar region near $r \approx \tilde{R}_g(1+a^2/\tilde{R}_g^2)$, forming the bright spots due to the RC effect. The appearance of the celestial body will be a ellipsoid revolving around the polar axis. In view of the same effect, the strong rediation pressure will push matter outward from the two polar regions,forming two jets from opposite diractions.

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