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Implication of strong magnetic field near the galactic center (GC)

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A key observation has been reported in 2013; an abnormally strong radial magnetic field near the GC is discovered. Firstly, we demonstrate that the radiations observed from the GC are hardly emitted by the gas of accretion disk which is prevented from approaching to the GC by the abnormally strong radial magnetic field and these radiations can't be emitted by the black hole model at the Center. However, the dilemma of the black hole model at the GC is naturally solved in our model of super massive object with magnetic monopoles (MMs). Three predictions in our model are quantitatively in agreement with observations: 1.) Plenty of positrons are produced from the direction of the GC with the rate is 6×10^{42} e^+/sec or so. This prediction is quantitatively confirmed by observation {(3.4-6.30) $\times 10^{42}$ e^+ sec^{-1}}. 2.) A strong radial magnetic field is generated by some magnetic monopoles condensed in the core region of the super massive object. The magnetic field strength at the surface of the object is about 20-100 Gauss at 1.1×10^4 R_s (R_s is the Schwarzschild radius) or $B \approx (10\text{-}50)$ *mG* at r = 0.12*pc*. This prediction is quantitatively in agreement with the lower limit of the observed magnetic field ≥ 8*mG*. 3.) The surface temperature of the super-massive object in the Galactic center is about 120 K and the corresponding spectrum peak of the thermal radiation is at 10^{13} Hz in the sub-mm wavelength regime. This is quantitatively basically consistent with the recent observation. The conclusions are that it could be an astronomical observational evidence of the existence of MMs and no black hole is at the GC. Besides, making use of both the estimations for the space flux of MMs and nucleon decay catalyzed by MMs (called the RC effect) to obtain the luminosity of celestial objects by the RC effect. In terms of the formula for this RC luminosity we are able to present a unified treatment for various kinds of core collapsed supernovae, SNII, SNIb, SNIc, SLSN and the production mechanism for γ ray burst, as well as the heat source of the Earth's core, the energy source needed for the white dwarf interior. This unified model can also be used to reasonably explain the possible association of the shot γ ray burst detected by the Fermi γ ray Burst Monitoring Satellite (GBM) with the September 2015 LIGO gravitational wave event GW150914.

Biography

Qiuhe Peng is mainly engaged in Nuclear Astrophysics, Particle Astrophysics and Galactic Astronomy research. In the field of Nuclear Astrophysics, his research project involved a neutron star (pulsar), the supernova explosion mechanism and the thermonuclear reaction inside the star, the synthesis of heavy elements and interstellar radioactive element such as the origin of celestial ^{26}Al. In addition, through his lectures, he establishes Nuclear Astrophysics research in China. He was invited by Peking University, by Tsinghua University (both in Beijing and in Taiwan) and by Nuclear Physics institutes in Beijing, Shanghai, Lanzhou to give lectures on Nuclear Astrophysics for many times. He has participated in the international academic conferences over 40 times and he has visited more than 20 countries. In 1994, he visited eight institutes in USA to give lectures. He is the first Chinese Astrophysicist to visit NASA and to give a lecture on the topic, Nuclear Synthesis of Interstellar ^{26}Al. In 2005, he visited USA twice and gave lectures in eight universities again. Inviting six astronomers of USA to give series lectures, he has hosted four consecutive terms summer school on gravitational wave astronomy. After the four-summer school obvious effect, at least 20 young scholars in China in the field of gravitational wave astronomy specialized learning and research. He has published 220 research papers.

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