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Extended Abstract

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The evidence of magnetic monopoles by astronomical observation and its astrophysical implication

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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 be naturally solved in our model of super massive object with magnetic monopoles (MMs) (Peng and Chou 2001). 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 610(42) e+/sec or so. This prediction is quantitatively confirmed by observation (3.4-6.3)10(42) e+/sec. 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*104 Rs (Rs is the Schwarzschild radius) or (10-50)mG at 0.12 pc . This prediction is quantitatively in agreement with the lower limit of the observed magnetic field >8mG (Eatough et al.2013); 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 (Falcke and Marko, 2013). The Conclusions are: It could be an astronomical observational evidence of the existence of MMs and no black hole is at the GC . 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 (Super Luminous Supernova) and the production mechanism for γ ray burst. The remnant of the supernova explosion is a neutron star rather than a black hole, regardless of the mass of the progenitor of the supernova.

Finally, We propose that the physical mechanism of Hot Big Bang of the Universe is also nucleons decay driven by the magnetic monopoles, similar to the supernova explosion.

There are some particle physics theories that go beyond the so-called ”standard cosmological model” to predict the existence of magnetic monopoles (MMs). The discovery of magnetic monopoles would be an incredible breakthrough in high-energy physics. The existence of MMs in the early Universe has been speculated and anticipated from Grand Unified Theory. If MMs exist, the inverse powers of the unification mass will not suppressed the baryon number violating effects of grand unified gauge theories. Therefore, MM catalyzing nucleon decay is a typical strong interaction. This phenomenon is due to the boundary conditions that must be imposed on the core of MM fermion fields. We present a possible mechanism to explain the formation of the Hot Big Bang Cosmology. The main ingredient in our model is nucleon decay catalyzed by magnetic monopoles (i.e., the Rubakov-Callan effect). It is shown that Hot Big Bang developed naturally, because the luminosity due to the Rubakov-Callan effect is much greater than the Eddington luminosity (i.e., Lm > 104LEdd).

, we have used the R−C effect to explain the formation of the Hot Big Bang and presented a possible mechanism that can delineate the details of how the Big Bang developed. The main ingredient in our description of the Hot Big Bang is MMs catalyzing nucleon decay with strong interaction cross section. Our results showed that whether the Universe is in an accelerating expansion phase needs further discussion. On the other hand, the direct observational evidence on the dark energy is also lost by the observational error analyses of SNIa. Our model of the Hot Big Bang is obtained in terms of the Rubakov-Callan luminosity and no other theoretical arguments or anticipation are required. In our model, the expansion phase may finally end followed by the contraction phase due to gravitational attraction. The popular view of indirect observational evidence for the accelerating expansion of the universe comes from the comparison of theoretical simulations of theaccelerating expansion of the universe and the deviation observation of the isotropy of the cosmic microwave background temperature using WMAP satellite observation data. The popular idea of indirect observational evidence for the accelerating expansion of the Universe comes from the comparison of theoretical simulations of the Universe accelerating expansion and the Universe with the observational data of WMAP satellite for the deviation observation of the isotropy of the cosmic microwave background temperature using WMAP satellite observation data. In recent years, the results of some research groups are in line with our ideas. For instance, Nielsen et al. (2016) analyzed recent observations of a group SNIa . Their conclusions did not support the accelerating expansion of the Universe. More recently, David et al. (2017) also did not support the idea of the accelerating expansion of the Universe.

Bottom Note: *This work is partly presented at International Conference on Planetary Science and Particle Physics*, August 27-28, 2018, Boston, USA