

Magnetic field contribution to black-hole-hedgehog's solution in GraviWeak unification

Wednesday, 24 October 2018 09:30 (20)

In the framework of Multiple Point Principle (MPP), where the existence of the two degenerate vacua of the Universe: the first, ElectroWeak vacuum with ≈ 246 GeV ("true vacuum"), and the second at Planck scale $\sim 10^{18}$ GeV ("false vacuum"); we investigated the gravitational black-hole-hedgehog's solution with magnetic field contribution in the GraviWeak unification model described by $f(R)$ gravity. We have considered the phase transition from the "false vacuum" to the "true vacuum" and confirmed the stability of the ElectroWeak vacuum. The "false vacuum" defect configurations for the black-hole-hedgehog have given a global monopole and this monopole has been "swallowed" by the black-hole with core mass $M_{BH} \approx 3.65 \times 10^{18}$ GeV and radius $\delta \approx 6 \times 10^{-21}$ GeV $^{-1}$. The horizon radius of the black-hole-hedgehog is around $r_h \approx 1.14\delta$.

Primary author(s) : Dr. DAS, Chitta Ranjan (Bogoliubov Laboratory of Theoretical Physics)

Co-author(s) : Prof. LAPERASHVILI, L.V. (National Research Center "Kurchatov Institute"); Prof. NIELSEN, H.B. (Niels Bohr Institute); Prof. SIDHARTH, B.G. (International Institute of Applicable Mathematics and Information Sciences)

Presenter(s) : Dr. DAS, Chitta Ranjan (Bogoliubov Laboratory of Theoretical Physics)

Session Classification : Gravitation and Cosmology