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Quark stars with isotropic matter in Hořava gravity and Einstein-æther theory

Wednesday, 7 July 2021 11:00 (25 minutes)

We study non-rotating and isotropic strange quark stars in Lorentz-violating theories of gravity, and in particular in Hořava gravity and Einstein-æther theory. For quark matter we adopt both linear and non-linear equations-of-state, corresponding to the MIT bag model and color flavor locked state, respectively. The new structure equations describing hydrostatic equilibrium generalize the usual Tolman-Oppenheimer-Volkoff (TOV) equations of Einstein's General Relativity. A dimensionless parameter ν measures the deviation from the standard TOV equations, which are recovered in the limit $\nu \longrightarrow 0$. We compute the mass, the radius as well as the compactness of the stars, and we show graphically the impact of the parameter ν on the mass-to-radius profiles for different equations of state describing quark matter. The energy conditions and stability criteria are also considered, and they are all found to be fulfilled.

Primary author: PANOTOPOULOS, Grigorios (CENTRA, IST, Universidade de Lisboa)

Presenter: PANOTOPOULOS, Grigorios (CENTRA, IST, Universidade de Lisboa)

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