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R^2 -gravity quark stars from perturbative QCD

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We investigate the structure of quark stars in the framework of $f(R) = R + \alpha R^2$ gravity using an equation of state for cold quark matter obtained from perturbative QCD, parametrized only by the renormalization scale. We show that a considerably large range of the free parameter α , within and even beyond the constraints previously reported in the literature, yield non-negligible modifications in the mass and radius of stars with large central mass densities. Besides, their stability against baryon evaporation is analyzed through the behavior of the associated total binding energies for which we show that these energies are slightly affected by the modified gravity term in the regime of high proper (baryon) masses

Primary authors: JIMÉNEZ, José; Dr PRETEL, Juan (CBPF); FRAGA, Eduardo (Instituto de Física, UFRJ); JORÁS, Sergio; Prof. RIBAMAR, Reis (IF-UFRJ)

Presenter: JORÁS, Sergio

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