Curvature-Matter Coupling and Anisotropic Strange Stars

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Abstract

The aim of this paper is to study the physical characteristics of anisotropic spherically symmetric quark star candidates for $R+2\sigma T$ gravity model, where R, σ and T depict scalar curvature, coupling parameter, and the trace of the energy-momentum tensor, respectively. In order to analyze the structure formation of quark stars, we consider the Heintzmann solution and assume that strange quark matter is characterized by MIT bag model equation of state. We evaluate the unknown parameters through matching conditions and obtain the values of radii of strange quark stars using modified Tolman-Oppenheimer-Volkoff equation with observed values of masses and bag constant. The feasibility of our considered solution is analyzed by graphical analysis of matter variables, energy bounds, causality condition and adiabatic index. It is found that the strange quark stars show the stable structure corresponding to Heintzmann solution and their stability enhances with increasing values of the model parameter σ.

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