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**Effect of  $f(R)$ -gravity models on compact stars.** (English. Russian original) [Zbl 1446.85003](#)  
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**Summary:** We study the possibility of forming anisotropic compact stars in the framework of  $f(R)$ -modified gravity in a static spherically symmetric space-time. We find the unknown coefficients involved in the metric using masses and radii of the compact stars 4U 1820-30, Cen X-3, EXO 1785-248, and LMC X-4. We obtain the hydrostatic equilibrium equation for different forces and use the generalized Tolman-Oppenheimer-Volkoff equation to analyze the behavior of stars. Moreover, we verify the regularity conditions, anisotropic behavior, energy conditions, and stability of the compact stars. We use the effective energy-momentum tensor in  $f(R)$  gravity for the analysis. We show that in the framework of  $f(R)$  gravity theory, these compact stars have physically acceptable patterns. Our results here also agree with those in general relativity, which is a special case of  $f(R)$  gravity.

**MSC:**

- 85A15 Galactic and stellar structure
- 76E20 Stability and instability of geophysical and astrophysical flows
- 83D05 Relativistic gravitational theories other than Einstein's, including asymmetric field theories
- 83C55 Macroscopic interaction of the gravitational field with matter (hydrodynamics, etc.)

**Keywords:**

anisotropic fluid;  $f(R)$  gravity; compact star

**Full Text:** [DOI](#)

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