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# Decoupled Quark Stars in Self-interacting Brans-Dicke Gravity

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We generate two anisotropic solutions for a static sphere filled with quark matter in the framework of self-interacting Brans-Dicke theory. For this purpose, we add an anisotropic source in the seed distribution and decouple the field equations through deformation in the radial metric function. As a result of this transformation, the field equations are disintegrated into two systems which separately include the effects of isotropic and anisotropic sources. The system related to the additional source is solved via the MIT bag model equation of state. We consider Tolman V spacetime and Karmarkar's condition to formulate two solutions for the isotropic sector which are extended to the anisotropic domain via decoupling technique. The junction conditions at the boundary determine the unknown parameters in terms of mass and radius of the spherical object. We investigate the viability and stability of the constructed strange star models in the presence of massive scalar field corresponding to three strange star candidates: Her X-1, PSR J1614-2230 and 4U 1608-52. It is concluded that the anisotropic models are well-behaved as they fulfill the necessary requirements for lower as well as higher values of the decoupling parameter.

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