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Some models of strange stars

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Abstract: We expect that the superdense stars with mass to size ratio more than 0.3 are made up of strange stars. we present the geometry of a 3-pavaboloid immersed in 4-dimensional Euclidean space for the 3-space of the interior spacetime of superdense star to give two parameter family of relativistic models of strange stars.

Keywords and phrases: Strange Star, Condensed Matter.

1. Introduction

There is conventional approach to obtain the relativistic models of superdense stars in equilibrium by prescribing the equation of state of interior matter and solving the associated Einstein's equations connecting the interior geometry with the dynamical variables. As the equations are nonlinear, so, one may analyse by using numerical procedures for obtaining solutions. Vaidya and Tikekar (1982), Tikekar (1990) presented an alternative approach, in the absence of reliable information about of superdense stars in equilibrium. Knutsen (1988), Maharaj and Leach (1996), Mukherjee et al (1997), Gupta and Jassim (2000) investigated superdense star models by using Vaidya and Tikekar ansatz. Sharma and Mukherjee (2001), Sharma et al (2000) Sharma et al (2002) obtained solutions of superdense stars based on Vaidya-Tikekar ansatz. Tikekar and Jotania (2005) suggested alternative ansatz to obtain three parameter solution for relativistic models of strange stars. Vishwakarma (2015) presented a new solution of Einstein's vacuum field equations.

We have presented the ansatz used by Finch and Skea (1989) to obtain to a two parameter family of strange stars like Her.X-1 in equilibrium.

2. Distributions on paraboloidal Spacetimes:

One may consider the interior spacetime of the star models based on the ansatz investigated by Finch and Skea (1989) as

$$ds^2 = e^{\nu(r)}dt^2 - \left(1 + \frac{r^2}{R^2}\right)dr^2 - r^2(d\theta^2 + \sin^2\theta d\theta^2) \tag{1}$$