Contribution ID: **35** Type: **Talk in a parallel session**

A new model of compact stellar objects with dark matter as its component

Thursday, 11 July 2024 18:00 (20 minutes)

In this paper, we develop a new model representing a spherically symmetric dark matter fluid sphere that could describe compact stellar objects. We consider that the compact star contains two regions namely, an isotropic inner core region with constant density and an anisotropic outer region with a specific realistic equation of state. We solve the system of field equation by assuming a particular density profile along
with prescribing a linear equation of state. With this, we solved the Einstein field equations. The obtained solutions are well-behaved and physically acceptable which represent equilibrium and stable matter configuration by satisfying the Tolman–Oppenheimer–Volkoff (TOV) equation. The interior solutions matched with the de Sitter metric at the core boundary and with the exterior Schwarzschild solution at the surface boundary. This solution is found to satisfy some well-known physical conditions e.g., energy conditions, causality conditions, and stability conditions for representing a stellar compact star. Considering a particular compact star EXO 1785-248 with its recently observed mass and radius, we analyzed the physical viability of the model by analyzing our solutions.

Primary author: Dr DAS, Shyam (Malda College)

Co-author: Prof. RAHAMAN, Farook

Presenter: Dr DAS, Shyam (Malda College)

Session Classification: Absolute stability of strange quark matter: from dark matter to stellar evolution

Track Classification: Compact Objects and Stellar Evolution (CO): Absolute stability of strange quark matter: from dark matter to stellar evolution