Contribution ID: **64** Type: **Talk**

Modeling anisotropic magnetized compact stars with γ metric: the white dwarfs picture

Friday 10 May 2019 10:20 (20 minutes)

Magnetic fields introduce an anisotropy in compact stars'equations of state by splitting the pressure into two components, one parallel and the other perpendicular to the magnetic field. This suggests the necessity of using structure equations accounting for the axial symmetry of the magnetized system. We consider an axially symmetric metric in spherical coordinates, the γ-metric, and construct a system of equations to describe the structure of spheroidal compact objects. In this way, we connect the geometrical parameter γ linked to the spheroid's radii, with the source of the anisotropy. So, the model relates the shape of the compact object to the physics that determines the properties of the composing matter.
To illustrate how our structure equations work, we present magnetized white dwarfs structure and discuss the stability of the solutions. The results are obtained for magnetic field values of 10^{12}G, 10^{13}G and 10^{14}G, in all cases with and without the Maxwell contribution to the pressures and energy density. This choice allows to have two sets of EoS, one featuring $\gamma > 1$ and other with $\gamma < 1$.

Authors: ALVEAR TERRERO, Diana (ICIMAF); HERNANDEZ MEDEROS, Victoria (ICIMAF); LÓPEZ PÉREZ, Samantha (Facultad de Física, Universidad de La Habana); MANREZA PARET, Daryel (Facultad de Física, Universidad de La Habana); PEREZ MARTINEZ, Aurora (ICIMAF); QUINTERO ANGULO, Gretel (Facultad de Física, Universidad de La Habana)

Presenter: ALVEAR TERRERO, Diana (ICIMAF)

Track Classification: SMFNS