Contribution ID: **257** Type: **Parallel Talk**

On the effects of magnetic fields and slow rotation in white dwarfs

Wednesday 25 October 2017 13:55 (25 minutes)

We use Hartle's formalism to study the effects of rotation in the structure of magnetized white dwarfs within the framework of general relativity. The inner matter is described by means of an equation of state for electrons under the action of a constant magnetic field, which breaks the SO(3) symmetry and introduces a splitting of the pressure into one parallel and other perpendicular to the magnetic field. Solutions correspond to typical densities of white dwarfs and values of magnetic field below 10^{13}G, considering perpendicular and parallel pressures independently, as if associated to two different equations of state.
Rotation effects obtained accounts for an increase of the maximum mass for both, magnetized and non-magnetized stable configurations, up to about 1.5 M . Further effects studied include the deformation of the stars, which become oblate spheroids and the solutions for other quantities of interest, such as the moment of inertia, quadrupolar momentum and eccentricity. In all cases, rotation effects are dominant with respect to those of the magnetic field.

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Session Classification: Parallel Sessions - HEP

Track Classification: High Energy Physics, Astrophysics and Cosmology (covering Hadron Structure, Phases of Nuclear Matter, QCD, Precision Measurements with Nuclei, Fundamental Interactions and Neutrinos)