

Stellar structure models of magnetized white dwarfs

Standard models of non-rotating compact stars assumes perfect spherical symmetry. However, due to high magnetic fields, these compact stellar objects can be deformed making them oblate or prolate spheroids with distinct equatorial and polar radii. Recent work on models of the global structure of highly magnetized neutron stars indicate the macroscopic stellar properties such as masses and radii along with the gravitational redshift can change depending on the type of deformation. In this work, we apply these deformation models on the global stellar structure of highly magnetized white dwarfs in the framework of general relativity and calculate said stellar properties. We further examine these deformities by calculating the gravitational quadrupole moment (mass distribution) which is expected to be non-zero and investigate any changes from traditional spherical models.

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