

STARS2015 - 3rd Caribbean Symposium on Cosmology, Gravitation, Nuclear  
and Astroparticle Physics / SMFNS2015 - 4th International Symposium on  
Strong Electromagnetic Fields and Neutron Stars

Contribution ID: 103

Type: **Talk**

## Revisited Magnetized White Dwarfs

*Thursday 14 May 2015 12:00 (15 minutes)*

We discuss the structure of Magnetized White Dwarfs by considering anisotropic equations of state (EoS) as well as the anisotropic equation of hydrostatic equilibrium. Specifically, we examine the weak and strong magnetic field limits.

For weak magnetic field values ( $B < B_c \sim 10^{13}G$ ) we obtain the EoS through an Euler-MacLaurin expansion of the thermodynamic potential. Whereas in the strong field regime ( $B > B_c$ ) we use a polytropic parametrization of the numerical relativistic EoS.

Our approach aims to have more treatable EoS and therefore facilitate the study of:

- 1) microscopic effects such as beta inverse decay and the pycnonuclear fusion reaction,
- 2) macroscopic consequences related to solutions of anisotropic structure equations, and
- 3) bound on the magnetic field imposed by the scalar Virial theorem.

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**Track Classification:** SMFNS2015