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The influence of strong magnetic fields on neutron stars and proto-neutron stars VERONICA DEXHEIMER, Kent State University — The magnetic field breaks spherical symmetry in stars causing the pressure transverse to the magnetic field direction to be different than the pressure parallel to it. We present explicit formulae appropriate at zero and finite temperature for both charged and uncharged particles including the effect of the anomalous magnetic moment. The inclusion of the anomalous magnetic moment increases the level of pressure anisotropy in both cases. We analyze different stages of magnetized star evolution incorporating baryon number conservation and the anisotropic energy momentum tensor. The first stages of the evolution are simulated through the inclusion of trapped neutrinos and fixed entropy per particle, while in the last stage the star is taken to be deleptonized and cold. We find that magnetic field effects, measured by the difference between the parallel and perpendicular pressures, are more pronounced in the beginning of the star evolution when there is a larger number of charged leptons and up quarks.

Veronica Dexheimer
Kent State University

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