

# Delta Baryons in Neutron-Star Matter under Strong Magnetic Fields

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In this work, we study magnetic field effects on neutron star matter containing the baryon octet and additional heavier spin 3/2 baryons (the  $\Delta$ 's). We make use of two different relativistic hadronic models that contain an additional vector-isovector self interaction for the mesons: one version of a relativistic mean field (RMF) model and the Chiral Mean Field (CMF) model. We find that both the additional interaction and a strong magnetic field enhance the  $\Delta$  baryon population in dense matter, while decreasing the relative density of hyperons. At the same time that the vector-isovector meson interaction modifies neutron-star masses very little ( $<0.1 M_{\odot}$ ), it decreases their radii considerably, allowing both models to be in better agreement with observations. Together, these features indicate that magnetic neutron stars are likely to contain  $\Delta$  baryons in their interior.

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