

Nuclear structure in strong magnetic fields: nuclei in the crust of a magnetar

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Covariant density functional theory is used to study the effect of strong magnetic fields, up to the limit predicted for neutron stars (for magnetars $B \approx 10^{18}$ G), on nuclear structure. All new terms in the equation of motion resulting from time reversal symmetry breaking by the magnetic field and the induced currents, as well as axial deformation, are taken into account in a self-consistent fashion. For nuclei in the iron region of the nuclear chart it is found [1] that strong fields in the order of magnitude of 10^{17} G are needed to significantly affect their bulk properties like masses and radii.

References

- [1] D. Peña Arteaga, M. Grasso, E. Khan, P. Ring, *in preparation*.