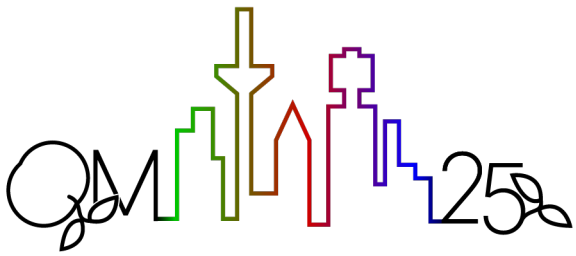

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Dense matter in the parity-doublet model

We discuss the thermodynamics of dense nuclear matter in the so-called parity-doublet model, in an extended mean-field approximation. Special emphasis is given to the phase structure at zero temperature and large baryon densities. The model includes the nucleon and its chiral partner. It also accommodates a nucleon mass that is compatible with the chiral symmetry of QCD, in contrast to many other relativistic model calculations. This residual nucleon mass delays the chiral symmetry restoration to densities typically greater than ten times the saturation density. We consider isospin-symmetric and isospin-asymmetric matter, continuously increasing the neutron excess all the way to pure neutron matter. We eventually compute the equation of state of neutron matter and the speed of sound, and confront the results in a semi-quantitative analysis to neutron-star observations and microscopic many-body calculations. Based on arXiv:2408.01302 and more recent developments.

Category

Theory

Collaboration (if applicable)

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