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Hot-Neutron Rich Nuclear Matter Studied with the BCPM Nuclear Energy Density Functional

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We have studied the thermal properties of a recently formulated nuclear energy density functional. The functional is known as BCPM (Barcelona-Catania-Paris-Madrid) and it is based on Brueckner calculations using the realistic Argonne v_{18} potential plus three-body forces of Urbana type. This functional has been successfully used to describe finite nuclei and cold neutron stars. Investigating the properties of hot β -stable matter for neutrino-free and neutrino-trapped scenarios is essential to perform astrophysical applications of the BCPM functional. In this work, the predictions of this functional for the mass-radius relation and the tidal deformability of compact stars at finite temperature are studied.

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