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Nuclear Matter Properties and Neutron Star Phenomenology Using the Finite Range Simple Effective Interaction

Tuesday 9 July 2024 14:15 (20 minutes)

The saturation properties of symmetric and asymmetric nuclear matter have been computed using the finite range simple effective interaction (SEI) having Yukawa form factor. The results for higher order derivatives of the energy per particle and the symmetry energy computed at saturation, namely,Q_0, K_{sym}, K_τ, Q_{sym}, are compared with the corresponding range of values extracted from studies involving theory, experiment as well as astrophysical observations. The ability of the equations of state computed with this SEI in predicting the threshold mass for the prompt collapse in binary neutron star merger and gravitational redshift is analyzed in terms of the compactness of the neutron star and the incompressibility at the central density of the maximum mass star. The correlations existing between neutron star properties with the nuclear matter saturation properties have been analyzed and compared with the predictions of other model calculations.

session

H. Equation of State and Neutron Stars

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