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Constraining Hadron-quark Phase Transition Parameters from Multimessenger Observations of Neutron Stars

We extend the quark mean-field (QMF) model for nuclear matter and study the possible presence of quark matter inside the cores of neutron stars. A sharp first-order hadron-quark phase transition is implemented combining the QMF for the hadronic phase with “constant-speed-of-sound” parameterization for the high-density quark phase. We develop a bayesian analysis framework by incorporating multimessenger observations of neutron star: the tidal deformability from gravitational wave events and mass-radius measurements from NICER. These information ensure us tightly constrain the phase transition parameters. We also discuss some astrophysical implications.

Topics

Other related physics

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