Bottom-Up Cross-Cutting Workshop "JENAS Initiative: Gravitational Wave Probes of Fundamental Physics"

Contribution ID: 32

Type: not specified

## Constraints on Phase Transition in Neutron Stars in a Generalized Setup

We examine the constraints on a first order phase transition from hadronic matter to deconfined quark matter, based on current astrophysical constraints. In particular we hypothesize the effect a well constrained mass radius data point of a compact star would have on the allowed parameter space. To this end we employ the most likely candidates of the recently updated NICER limits of PSR J0030+0451. A parameterizable relativistic mean field equation of state in compliance with  $\chi_{EFT}$  results is used, where the stiffness of the equation of state can be varied. The phase transitions is modeled using a Maxwell construction. We find that astrophysical constrains have reduced the parameter space for a phase transition to such an extend that mass and radius measurements may become unreliable in providing indicators for a phase transition in the near future.

Primary author: CHRISTIAN, Jan-Erik Presenter: CHRISTIAN, Jan-Erik