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Probing the equation of state of dense matter with neutron stars

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Neutron stars (NSs) are unique laboratories to probe matter in extreme conditions that cannot be currently reproduced on Earth. Nuclear physics experiments, in tandem with astrophysical observations, can give valuable insight into the properties of dense matter encountered in these stellar objects.

The connection between astrophysical observations and microphysical properties of NSs requires both microscopic and macroscopic (global) modelling. For cold (mature), slowly rotating, and isolated NSs, this connection mainly relies on the knowledge of the equation of state (EoS).

In this presentation, I will give a brief introduction on the NS EoS, in connection with current constraints coming from both nuclear-physics and astrophysics. The prediction for NS properties and observables obtained using different EoSs (with their associated uncertainties) will be also presented in relation with recent (multi-messenger) astrophysical observations.

session

H. Equation of State and Neutron Stars

Primary author: FANTINA, Anthea Francesca (Grand Accélérateur National d'Ions Lourds (GANIL))

Presenter: FANTINA, Anthea Francesca (Grand Accélérateur National d'Ions Lourds (GANIL))

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