Contribution ID: **34** Type: **not specified**

Purely phenomenological equation of state for nuclear matter

Friday, October 2, 2015 10:50 AM (40 minutes)

The nuclear equation of state is still a very challenging issue for nuclear astrophysics, determining the masses and radii of neutron stars
as well as the properties of core-collapse supernovae.
Many nuclear modeling, being more or less phenomenological, exist but the relation between their parameters and
the final astrophysical observation is usually quite complex and requires statistical analysis.
In this talk, we will present a purely phenomenological equation of state which is able to mimic all existing modelings that we have tested.
It stands for an unifying model for the nuclear equation of state, which main advantage is the clear relation between the empirical parameters of nuclear
matter and the parameters of the model.
We first apply this new approach to understand the relation between masses and radii of neutron stars and empirical parameters
and identify the most determinant ones.

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