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Equation of state in dense nuclear matter controlled by nuclear data

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I will present two recent analyses of nuclear data, i.e. flow data from heavy ion collision (HIC) and giant monopole resonances (GMR). These data provide constraints to nuclear matter with an equal number of neutrons and protons. To do so, the model for dense nuclear matter equation of state (EoS) is enriched in order to be sensible to properties close to saturation density, i.e. the curvature of the energy per particle represented by the nuclear empirical parameter Ksat, as well as to its properties as the density departs further from saturation density and represented by the skewness parameter Qsat. These two parameters control the density dependence of the EoS for nuclear densities. Employing IQMD to model HIC and a Bayesian approach to confront it to flow data, we find that the EoS is preferred to be soft around saturation density and to stiffen above. In a complementary way, GMR data also prefer soft EoS around saturation density. These recent results advocate for a more systematic use of the Bayesian approach to confront EoS and nuclear data.

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