

Asymmetrical nuclear EOS study with CEE

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For the equation of state (EOS) of neutron rich nuclear matter, what has been most uncertain is the symmetry energy term related to the energy cost of converting protons into neutrons in nuclear medium. Particularly at suprasaturation densities, the convincing density dependence of the symmetry energy is not yet available neither experimentally nor theoretically. Nuclear reactions, especially heavy-ion reactions induced by heavy neutron-rich beams sub-GeV/u, can produce dense nuclear matter with large N/Z asymmetry and thus provide an opportunity to probe the symmetry energy in terrestrial laboratories. In this talk, I will first review the latest theoretical and experimental progress in constraining the density dependence of the nuclear symmetry energy and its implications to the research of neutron stars, using heavy ion collisions below 1 GeV. I will then introduce the newly proposed experiment, the CSR External Experiment (CEE) on the Cooling Storage Ring at the Heavy Ion Research Facility at Lanzhou, China(HIRFL-CSR).

Keywords

symmetry energy, nuclear equation of state, CEE, HIRFL-CSR

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