

Propose of studying the symmetry energy of asymmetric nuclear matter under super-saturation density at the Cooling Storage Ring at Lanzhou

Abstract: The Cooling Storage Ring (CSR) at Lanzhou, China is a heavy-ion facility that can accelerate nuclei up to ^{238}U with a kinetic projectile energy of several hundred MeV to GeV. By utilizing the CSR heavy-ion beam on an external target, dense QCD matter can be created. The equation of state (EOS) of the strongly coupled matter can be studied via properly chosen physical observables, among which the π^-/π^+ production ratio probes the symmetry energy of the asymmetrical nuclear matter at high densities. An External Target Experiment (ETE) is currently proposed for this study based on first-stage simulation and experimental work. To provide precise measurements and solid constraint to theory and models, experiment design and systematic requirements must be carefully studied.

[References]

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