

Abstract Submitted
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Constraining neutron-proton effective mass splitting and density dependence of nuclear symmetry energy using heavy-ion collisions¹ BAO-AN LI, Texas A&M University-Commerce — While significant progress has been made in understanding the density and momentum dependence of nuclear isovector interaction and the corresponding symmetry energy of neutron-rich nucleonic matter around saturation density, many challenging questions remain to be addressed especially at supra-saturation densities [1]. According to the Hugenholtz-Van Hove theorem [2], nuclear symmetry energy and its slope L are determined by the nucleon isovector (symmetry) potential and its momentum dependence [3]. The latter determines uniquely the neutron-proton effective k -mass splitting in neutron-rich nucleonic matter. Using currently available constraints on the symmetry energy from 28 recent analyses of various terrestrial nuclear laboratory experiments and astrophysical observations, we infer the corresponding neutron-proton effective k -mass splitting [4] and discuss potentially useful observables for further improving the constraints using heavy-ion reactions.

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