

High-momentum squeezed-out n/p ratio as a probe of K_{sym} of the symmetry energy

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By involving the constraints of the slope of nuclear symmetry energy L into the question of determination of the high-density symmetry energy, one needs to probe the curvature of nuclear symmetry energy K_{sym} . Based on the Isospin-dependent Boltzmann-Uehling-Uhlenbeck (IBUU) transport model, effects of the curvature of nuclear symmetry energy on the squeezed-out nucleons are demonstrated in the semi-central Au+Au reaction at 400 and 600 MeV/nucleon. It is shown that the squeezed-out isospin-dependent nucleon emissions at high transverse momenta are sensitive to the curvature of nuclear symmetry energy. The curvature of nuclear symmetry energy at saturation density thus can be determined by the high momentum squeezed-out isospin-dependent nucleon emissions experiments from the semi-central Au+Au reaction at 400 or 600 MeV/nucleon.

The curvature of nuclear symmetry energy K_{sym} is related to the high-density and low-density symmetry energy. Thus, the curvature of low-density symmetry energy is constrained with the n/p of squeezed-out nucleon and direct flows of nucleon in the central $^{132}\text{Sn}+^{124}\text{Sn}$ reaction at 270 MeV/nucleon. Then, the constraints of the curvature of high-density symmetry energy are by elliptic flows of nucleon and π^-/π^+ , which effected by both of low-density and high-density symmetry energy.

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