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Directed and triangular flow of identified hadrons and light nuclei from fixed-target energies at RHIC-STAR

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The anisotropic flow parameters (v_n) offer insights into collective hydrodynamic expansion and transport properties of the produced medium at higher collision energies, while they are sensitive to the compressibility of the nuclear matter and nuclear equation of state at lower collision energies. Among them directed flow (v_1) describes the collective sideward motion of produced particles in heavy-ion collisions. It is an important probe to study the in-medium dynamics as it is sensitive to the equation of state (EoS) of the produced medium. Minimum in the slope of directed flow (dv_1/dy) as a function of collision energy has been proposed as a signature of the first-order phase transition between hadronic matter and quark-gluon plasma. The triangular flow (v_3) typically arises from the initial condition fluctuations and is expected to be uncorrelated to the reaction plane. However, recent measurements at lower collision energies show a correlation between v_3 and the first-order event plane angle (Ψ_1).
In this poster, we will report measurements of v_1 and v_3 for π, K, p, d, and t in Au+Au collisions at $\sqrt{s_{NN}}$ = 3.2, 3.5, 3.9, 4.5, 6.2, 7.2, and 7.7 GeV in fixed-target mode from the second phase of beam energy scan (BES-II) program at RHIC-STAR. The rapidity, centrality, and collision energy dependence of v_1 and v_3 will be shown and their physics implications will be discussed.

Category

Experiment

Collaboration (if applicable)

STAR Collaboration

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