Anisotropic flow of identifed particles in Au + Au collisions at $\sqrt{s_{NN}}$ = 3.0 - 19.6 GeV

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Directed and elliptic flow (v_1, v_2) are sensitive to the dynamics of heavy-ion collisions at the early stage of the system evolution and the equation of state (EoS) of the medium. The v_1 slope (dv_1/dy) at mid-rapidity of net-baryons is expected to be sensitive to the first-order phase transition. Also, triangular flow (v_3) provides valuable information on the initial geometry fluctuations and transport properties of the medium. Studying these flow harmonics for various identified particles at different energies provides insights into the medium going through QCD phase transition. In particular, (multi-) strange hadrons with small hadronic cross-sections are cleaner probes of the early stages of heavy-ion collisions. A comprehensive study of light and (multi-) strange hadrons provides valuable insights into the subsequent stages of the medium evolution.

In this talk, the measurements of v_1, v_2, and v_3 for both light and (multi-) strange hadrons at $\sqrt{s_{NN}}$ = 3.0, 3.2, 3.5, 3.9, 7.7, 9.2, 11.5, 14.6, and 19.6 GeV, utilizing the enhanced capabilities of the STAR detectors and datasets with increased statistics from the second phase of the RHIC beam energy scan (BES-II) program, will be presented. The centrality dependence of anisotropic flow and the test of number of constituent quark (NCQ) scaling will be shown. Also, the energy and centrality dependence of v_1 slope and p_T-integrated v_2 will be discussed. The data will be compared with different model calculations, and the inferences on the QCD phase structure and EoS of nuclear matter in the high baryon density region will be discussed.