Azimuthal anisotropy measurement of strange hadrons in Au+Au collisions at $\sqrt{s_{NN}}$ = 27 and 54.4 GeV at STAR

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Abstract

The hadronic interaction cross section for (multi)strange hadrons are expected to be small. Hence, the study of azimuthal anisotropy of (multi)strange hadrons allows one to access the collective properties of early stages in heavy-ion collisions. The STAR experiment recently recorded high statistics data for Au+Au collisions at a new centre-of-mass energies ($\sqrt{s_{NN}}$) of 54.4 GeV (∼1.3 billion events) and 27 GeV (∼600 million events). The newly installed Event Plane Detector (EPD) allows one to measure the azimuthal anisotropy of particles with high precision and less non-flow contributions using event plane with large gaps in rapidity.

In this poster, we will present the second-order azimuthal anisotropy (v_2) of (multi)strange hadrons (K^0_S, ϕ, Λ, Ξ, Ω) measured at midrapidity ($|y|$ <0.5) as a function of transverse momentum (p_T) and centrality at $\sqrt{s_{NN}}$=27 and 54.4 GeV. Measurement will be carried out using event planes from both Time Projection Chamber ($|\eta|$<1.0) and EPD (2.1<$|\eta|$<5.1). High precision test of the number of constituent quark scaling of v_2 (including light hadrons) will be shown. The results will be compared to transport-based model calculations. Finally, the physics goals of such measurements at the other $\sqrt{s_{NN}}$ = 19.6, 11.5, 9.2 and 7.7 GeV of beam energy scan phase II will be discussed.