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Measurement of directed flow of K^{*0} and ϕ Resonances in Au+Au collisions at RHIC BES energies

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It is known from earlier studies that the hadronic interaction affects the measured yield of short lived resonance e.g. K^{*0}. Recent studies [1] show that the directed flow (v_1) of K^{*0} is strongly affected during the hadronic stage due to asymmetric loss in different sides of the p_x axis in momentum space caused by the tilted fireball and density dependent rescattering. Therefore the v_1 of K^{*0} can be a good probe to study the late-stage hadronic interaction and provide more information (e.g rescattering affected by variations in matter density across phase-space) compared to the yield measurement integrated over full azimuth and rapidity.

We present the first measurement of directed flow of K^{*0} resonances in Au+Au collisions at $\sqrt{s_{NN}}$ = 14.6, 19.6 and 27 GeV. Centrality-dependent difference in directed flow between charged kaons and K^{*0} resonances will be presented. The difference in directed flow between charged kaons and ϕ mesons will be also shown. The results will be compared with a hydrodynamic model that incorporates a hadronic afterburner [1]. The measured v_1 of K^{*0} resonances can provide more insights into hadronic rescattering and regeneration processes in heavy-ion collisions and can constrain transport-based models of QCD matter.

[1] Phys. Rev. C 109, 044905 (2024)

Category

Experiment

Collaboration (if applicable)

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