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

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**Abstract**

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 $\sqrt{s_{NN}}$ = 14.5, 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 $\phi$ 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).