

# Probing the hadronic phase via the measurement of resonances in Au+Au collisions at $\sqrt{s_{NN}} = 19.6$ GeV from STAR BES-II

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Resonances of different lifetimes can be used to probe the hadronic stage of the fireball produced in relativistic heavy-ion collisions. For example, the  $K^{*0}$  meson, with a lifetime of  $\sim 4.16$  fm/c, decays within the fireball and its decay daughters may experience in-medium effects like re-scattering and regeneration. On the other hand, the  $\phi$  meson, having a long lifetime of  $\sim 46$  fm/c, is expected to decay outside the fireball and its daughter particles may remain immune to these medium effects. Hence simultaneous measurement of these resonances will help us to investigate the interplay of re-scattering and regeneration effects.

Recently, the STAR experiment at RHIC has accumulated a high-statistics data sample of Au+Au collisions at  $\sqrt{s_{NN}} = 19.6$  GeV with enhanced detector capabilities and a wider pseudorapidity coverage during the BES-II program. In this talk, we will present measurements of  $K^{*0}$  transverse momentum ( $p_T$ ) spectrum, rapidity distribution, integrated yield and average  $p_T$ , using this data sample. The  $\langle p_T \rangle$  of  $K^{*0}$  will be compared with those of other hadrons. The resonance to non-resonance ratios ( $K^{*0}/K$ ,  $\phi/K$ ) will be shown as a function of centrality to study the rescattering/regeneration effects. An estimate of the lower limit of the hadronic phase lifetime will be shown as a function of centrality, and compared to previous RHIC and LHC results.

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