

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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1 Resonances of different lifetimes can be used to probe the hadronic stage of
2 the fireball produced in relativistic heavy-ion collisions. For example, the K^{*0}
3 meson, with a lifetime of ~ 4.16 fm/c, decays within the fireball and its decay
4 daughters may experience in-medium effects like re-scattering and regeneration.
5 On the other hand, the ϕ meson, having a long lifetime of ~ 46 fm/c, is expected
6 to decay outside the fireball and its daughter particles may remain immune to
7 these medium effects. Hence simultaneous measurement of these resonances will
8 help us to investigate the interplay of re-scattering and regeneration effects.
9 Recently, the STAR experiment at RHIC has accumulated a high-statistics data
10 sample of Au+Au collisions at $\sqrt{s_{NN}} = 19.6$ GeV with enhanced detector capa-
11 bilities and a wider pseudorapidity coverage during the BES-II program. In this
12 talk, we will present measurements of K^{*0} transverse momentum (p_T) spectrum,
13 rapidity distribution, integrated yield and average p_T , using this data sample.
14 The $\langle p_T \rangle$ of K^{*0} will be compared with those of other hadrons. The resonance
15 to non-resonance ratios (K^{*0}/K , ϕ/K) will be shown as a function of centrality
16 to study the rescattering/regeneration effects. An estimate of the lower limit
17 of the hadronic phase lifetime will be shown as a function of centrality, and
18 compared to previous RHIC and LHC results.