

Measurements of $K^{*0,\pm}$ mesons in Au+Au (BES-II) and Ru(Zr)+Ru(Zr) collisions at RHIC

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The comparison between the production of short-lived resonances (e.g., K^*) to non-resonances (e.g., K) is commonly employed to understand the role of re-scattering and regeneration processes that occur during the late stages of hadronic interactions. Additionally, the neutral (K^{*0} ($d\bar{s}$)) and charged (K^{*+} ($u\bar{s}$)) vector mesons share similar mass and isospin, but the magnetic moments of their constituent quarks differ by approximately a factor of five. This distinction makes them a unique probe for studying medium effects and particle production.

In this talk, we will present the mass, width, transverse momentum (p_T) spectra, yield (dN/dy), and $\langle p_T \rangle$ of $K^{*0,\pm}$ mesons, utilizing data from the 2nd phase of the RHIC Beam Energy Scan (BES-II) program on Au+Au collisions at $\sqrt{s_{NN}} = 7.7 - 19.6$ GeV, and isobar collisions (Ru+Ru and Zr+Zr) at $\sqrt{s_{NN}} = 200$ GeV. The high-statistics sample of isobar collisions will enable precise and differential measurements of particles and anti-particles (K^{*0} , \bar{K}^{*0} , and $K^{*\pm}$), separately. The results of the K^{*+}/K^{*0} ratio can be utilized to probe isospin effects. Moreover, comparing the K^{*0}/K^- ratio between Au+Au and isobar collisions can provide insights into the energy and system size dependence of hadronic interactions.

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