

Strangeness production in Au+Au collisions at $\sqrt{s_{NN}} = 7.7$, 14.6, 19.6, and 200 GeV with the STAR experiment

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The main goals of relativistic heavy-ion collisions at various energies at RHIC are the studies of the QCD phase structure and the properties of the quark gluon plasma. Strange hadrons, which may decouple earlier from the hadronic system, have been suggested as sensitive probes to the early dynamics of the fireball created in heavy-ion collisions.

Measurements from the first phase of the beam energy scan (BES) program have indicated potential changes in the medium properties with decreasing collision energy. However, the precision of those measurements is not sufficient to draw definitive conclusions. During BES phase-II (BES-II), STAR has accumulated high statistics data in Au+Au collisions at various energies, which can help reduce the uncertainties in the strange hadron measurements, in particular for the multi-strange hadrons. Benefiting from the iTPC upgrade, the strangeness measurements are now extended from mid-rapidity ($|y| < 0.5$) to a larger rapidity range ($|y| < 1.5$) as well. In this talk, we will present STAR measurements of strange hadron (K_s^0 , Λ , $\bar{\Lambda}$, Ξ , $\bar{\Xi}$, ϕ) production in Au+Au collisions at $\sqrt{s_{NN}} = 7.7, 14.6, 19.6$ GeV from BES-II and $\Omega(\bar{\Omega})$ production in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV, including transverse-momentum and rapidity spectra, nuclear modification factors, baryon-to-meson and antibaryon-to-baryon ratios. New insights on the collision dynamics will be discussed.