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

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The main goals of relativistic heavy-ion collisions at various energies at RHIC include the study of the QCD phase structure and the properties of the quark gluon plasma. Strange hadrons have been suggested as sensitive probes to the early dynamics of the fireball created in heavy-ion collisions. Ratios of particle yields involving strange particles are often utilized to study various properties of the nuclear mater, such as the strangeness and baryon chemical potentials at the chemical freeze-out temperature (μ_S/T_{ch} and μ_B/T_{ch}). In addition, coalescence model calculations indicate that the Ω/ϕ and $(K^+\Xi^-)/(\phi\Lambda)$ yield ratios are sensitive to strange quark thermodynamic properties and density fluctuations respectively, hence their dependence on the collision energy can potentially probe the onset of deconfinement and the location of the critical end point.

In this talk, we will report on measurements of strange hadron (ϕ, K^0_s, Λ, $\bar{\Lambda}$, Ξ, $\bar{\Xi}$, Ω, $\bar{\Omega}$) production in Au+Au collisions at $\sqrt{s_{\rm NN}}$ = 7.7-19.6 GeV. The data were taken during the Beam Energy Scan phase-II program (BES-II) by the STAR experiment. The transverse momentum (p_T), centrality dependence of strange hadron yields and the nuclear modification factor will be presented. Additionally, rapidity (y) spectra of strange hardons, as well as the yield ratios (such as antibaryon-to-baryon ratios, $(K^+\Xi^-)/(\phi\Lambda)$ and Ω/ϕ etc.) at $\sqrt{s_{NN}}$ = 7.7-19.6 GeV, will be shown, and the physics implications will be discussed.

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