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

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## Abstract

The main motivation of the Beam Energy Scan (BES) program at RHIC is to search for and study structures in the QCD phase diagram such as the conjectured critical end point, the predicted first order phase transition between hadronic and partonic matter and the chiral phase transition. Strangeness production has been suggested as a sensitive probe to the early dynamics of the deconfined matter created in heavy-ion collisions. Ratios of particle yields involving strange particles are often utilized to study various properties of the nuclear matter, such as the strangeness and baryon chemical potentials at the chemical freeze-out temperature ($\mu_s/T_{ch}$ and $\mu_B/T_{ch}$). In addition, coalescence model calculations indicate that the $\Omega/\phi$ 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 critial end point.
In this talk, we will report on measurement of strange hadrons ( $\phi$, $K^0_s$, $\Lambda$, $\overline{\Lambda}$, $\Xi$, $\overline{\Xi}$, $\Omega$, $\overline{\Omega}$) production in Au+Au collisions at $\sqrt{s_{NN}}$ = 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 hadrons, as well as yield ratios (such as antibaryon-to-baryon ratios, $(K^+\Xi^-)/(\phi\Lambda)$ and $\Omega/\phi$ etc.) at $\sqrt{s_{NN}}$ = 7.7-19.6 GeV, will be shown, and the physics implications will be discussed.