

# Strangeness production in Au+Au collisions at $\sqrt{s_{NN}} = 27, 19.6, \text{ and } 14.5 \text{ GeV}$ from STAR

Sameer Aslam, Yan Huang  
(for the STAR Collaboration)

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## Abstract

Relativistic heavy-ion collisions provide a unique opportunity to study the properties of strongly interacting matter under extreme conditions. Search for the QCD critical point and the onset of deconfinement is the main motivation of the beam energy scan (BES) program at RHIC. Strangeness (especially the multi-strangeness) production has been suggested as a sensitive probe to the early dynamics of the deconfined matter created in heavy-ion collisions. The data taken during 2010 and 2011 in BES phase-I, have indicated the potential changes of medium properties in between  $\sqrt{s_{NN}} = 19.6 \text{ GeV}$  and  $11.5 \text{ GeV}$ . However, the statistics collected during the BES phase-I are not enough to draw definite conclusions. Since 2018, STAR has conducted the BES phase-II program and accumulated high statistics Au+Au collisions data at various energies ( $\sqrt{s_{NN}}$ ) below  $27 \text{ GeV}$ . The productions of  $K_s^0$ ,  $\Lambda$ ,  $\Xi$ ,  $\Omega$ , and  $\phi$  from Au+Au collisions at  $\sqrt{s_{NN}} = 27, 19.6, \text{ and } 14.5 \text{ GeV}$  will be presented in this talk. The strange hadron spectra, nuclear modification factors, and particle ratios (in particular  $\Omega/\phi$ ) will be reported. The physics implications on the collision dynamics will also be discussed.