Strange hadron production in Au+Au collisions at $\sqrt{s_{NN}} = 54.4$ GeV

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The RHIC Beam Energy Scan (BES) Program is proposed to study the Quantum Chromodynamics phase transition and to locate the onset of deconfinement. As a sensitive probe to the transition from the hadron gas to the Quark-Gluon Plasma, the particle ratios of strange hadrons are measured to study the properties of nuclear matter and extract the chemical freeze-out parameters [1,2].

Recently, the production of strange hadrons ($K_S^0, \Lambda, \overline{\Lambda}, \Xi^-, \overline{\Xi}^+, \Omega^-, \overline{\Omega}^+, \text{and } \phi$) at mid-rapidity ($|y| < 0.5$) in Au+Au collisions at $\sqrt{s_{NN}} = 54.4$ GeV are measured at the Relativistic Heavy Ion Collider STAR experiment. In this talk, transverse momentum spectra, nuclear modification factor $R_{\rm cp}$, baryon-to-meson ratio, as well as the overall integrated yields of these strange hadrons at 54.4 GeV are presented. In particular, the multi-strange baryon-to-meson ratio $N(\Omega^- + \overline{\Omega}^+)/[2N(\phi)]$ at 54.4 GeV is studied and compared to previous measurement at other BES energies [3]. The strange-hadron-to-pion ratios versus charged hadron multiplicity are also studied and compared to the measurements in heavy-ion collisions at higher energies.

[1] Phys. Rev. C 102, 034909 (2020)
[2] Phys. Rev. C 96, 044904 (2017)
[3] Phys. Rev. C 93, 021903(R) (2016)