Baryon-Strangeness Correlations in Au+Au Collisions at RHIC-STAR

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Abstract

Fluctuations and correlations of conserved charges serve as sensitive observables for investigating QCD thermodynamics. In particular, baryon-strangeness correlations may offer insights on changing degrees of freedom carrying strangeness.

In this work, we present the measurements of baryon-strangeness correlations in Au+Au collisions from the beam energy scan program (BESI and BESII, 7.7-62.4 GeV) at STAR. This analysis includes newly analyzed datasets, marking the systematic investigation of the collision energy and centrality dependence of baryon-strangeness correlations. The study includes strange hadrons K^+, Λ, and Ξ^- along with their anti-particles. Physics implications will be discussed by comparing these new results with calculations from lattice gauge theory, functional renormalization group, hadron resonance gas model, as well as hadronic transport model.