

Baryon-Strangeness Correlations in $\sqrt{s_{\text{NN}}} = 3$ and 200 GeV Au+Au Collisions from RHIC-STAR

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1 Higher-order cumulants of conserved quantities like net-baryon, net-charge, and
2 net-strangeness are proposed as sensitive observables to the QCD critical point
3 and have been studied extensively in experiment [1] and theory [2]. Similarly, the
4 different combinations of off-diagonal cumulants also show sensitivities to QCD
5 phase transition [3]. Recently published results of proton cumulants in $\sqrt{s_{\text{NN}}} = 3$
6 GeV Au+Au collisions indicate that hadronic interactions are dominant at 3 GeV
7 and the QCD critical point could exist at higher collision energies.

8 To further confirm the turn-off of the QGP signal at $\sqrt{s_{\text{NN}}} = 3$ GeV, we have
9 performed an analysis of baryon-strangeness correlations with proton, K^\pm , and
10 hyperons (Λ and Ξ) and have measured the ratio $C_{\text{BS}} = \langle \text{BS} \rangle_c / \langle \text{S}^2 \rangle_c$, where $\langle \text{BS} \rangle_c$
11 represents the 2nd-order mix-cumulant between net-baryon and net-strangeness
12 while $\langle \text{S}^2 \rangle_c$ is the 2nd-order net-strangeness cumulant. In this talk, we present the
13 centrality dependence of the C_{BS} ratio from $\sqrt{s_{\text{NN}}} = 3$ and 200 GeV Au+Au colli-
14 sions by RHIC-STAR experiment. We compare our results with model calculations
15 and discuss about the physics implications.

16 References

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