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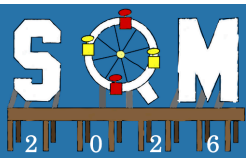

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Fluctuations and Correlations of Conserved Charges in Isobar Collisions at $\sqrt{s_{NN}}$ = 200 GeV with STAR Detector

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Fluctuations and correlations of conserved charges, such as net-charge (Q), net-baryon (B), and net-strangeness (S), are sensitive to the quantum chromodynamics (QCD) phase transition and the QCD critical point. To achieve this goal, previous studies have focused on the fluctuations of conserved charges, while the correlations of conserved charges also hold significant physical significance. The baryon-strangeness number correlations can provide an important experimental criterion for the degrees of freedom in the quark-gluon plasma (QGP) [1]. Further, baryon-charge number (BQ) correlations are highly sensitive to magnetic fields and can be used to infer the magnetic field strength within the collision system [2].

In this talk, we report the centrality dependence of the second order conserved charges correlations (B-Q, Q-S, B-S) in isobar collision systems (Ru+Ru and Zr+Zr) at $\sqrt{s_{NN}}$ = 200 GeV with STAR. The measurements are performed by including various particles p, k, π, Λ, and Ξ as proxies for conserved charges. The results from the two system will be compared and the physics implications will be discussed.

[1] V. Koch, A. Majumder, and J. Randrup, Baryon-Strangeness Correlations: A Diagnostic of Strongly Interacting Matter, Phys. Rev. Lett. \textbf{95}, 182301 (2005).

[2] H.-T. Ding, J.-B. Gu, A. Kumar, and S.-T. Li, Second order fluctuations of conserved charges in external magnetic fields, Phys. Rev. D \textbf{111}, 114522 (2025).

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