The STAR measurements on off-diagonal cumulants of net-particle multiplicity distributions in Au+Au collisions at $\sqrt{s_{NN}}$ = 7.7-200 GeV

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Abstract

We present measurements of the second-order off-diagonal cumulants of net-charge, net-proton, and net-kaon multiplicity distributions in Au+Au collisions at $\sqrt{s_{NN}}$ = 7.7-200 GeV. We focus on the pseudorapidity window and centrality dependence of these cumulants. We compare our results with the hadron resonance gas (HRG) and UrQMD calculations. The energy dependence of the second order off-diagonal over diagonal cumulant ratios cannot be fully described by different model calculations [1]. We extend such measurements to the third-order off-diagonal cumulants. These measurements provide important insights on the correlations between different conserved charges from the QGP and hadronic phase, as well as their dependence with temperature and baryon chemical potential. We also study correlations between net-pion with net-proton as well as net-pion and net-kaon that have recently been shown to constrain frameworks of local charge conservation during hadronization [2].

References

[1] J. Adam et al. , STAR Collaboration, arXiv:1903.05370 [nucl-ex]. 2019.

[2] D. Oliinychenko and V. Koch. , arXiv: 1902.09775 [hep-ph]. 2019.