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Measurements of Λ - Λ , Ξ - Ξ , and p - Ξ Correlations in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV and p-p Correlation in Au+Au FXT target collisions at $\sqrt{s_{NN}} = 3$ GeV at RHIC-STAR

Wednesday, May 19, 2021 10:30 AM (20 minutes)

Understanding of baryon-baryon interactions is important to examine the existence of stranglets and various exotic hadrons, e.g. H-dibaryon, and to model of astronomical objects such as neutron stars. However hyperon-nucleon and hyperon-hyperon interactions are not fully understood yet. In high energy heavy-ion collisions, a large number of particles including (multi-)strangeness are produced, which may allow us to study those interactions via femtosopic measurements with better precision. At low relative momentum, the correlations between two particles are influenced by the strong and Coulomb interactions as well as quantum statistical effect sensitive to the emission source size for identical pairs. Thus measuring correlations of two baryons is a useful probe to extract the scattering parameters between the baryons and the size of the particle emission.

In this talk, we present measurements of Λ - Λ correlations in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV with largely improved statistical precision compared to previous measurements for studying a possible Λ - Λ bound state. We will also present the first measurements of Ξ - Ξ and p - Ξ correlations in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV. New results of p-p correlation in FXT target mode Au+Au collisions at $\sqrt{s_{NN}} = 3$ GeV will be also presented as a function of the collision centrality, transverse momenta, and rapidity, and will be compared with the calculations from UrQMD transport model. In addition, a systematic energy dependence of the p-p correlation functions will be discussed.

Collaboration

STAR Collaboration

Presenter: ISSHIKI, Moe (University of Tsukuba (JP))

Session Classification: Resonances and Hypernuclei (I)

Track Classification: Bulk matter phenomena associated with strange and heavy quarks