

Measurements of Λ - Λ and Ξ - Ξ correlations in Au+Au collisions at $\sqrt{s_{\text{NN}}} = 200$ GeV at RHIC-STAR

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The interaction between hyperon-hyperon (YY) is not well understood theoretically and experimentally. The YY interaction is important to understand the equation of state of neutron star interior as well as to search for exotic hadrons such as H-dibaryon. The H-dibaryon was proposed as a stable six-quark state resulting from combination of two Λ hyperons. According to the lattice QCD calculation [1], H-dibaryon could be in a deeply bound state or in a shallow bound state, or two Λ hyperons have weak unbound attractive interaction, depending on quark mass. On the other hand, the observation of double hypernuclei [2] suggests that they are not in a deeply bound state, although more experimental inputs are needed to clarify the nature of possible H-dibaryon state. For the case of two Ξ (strangeness $S = -4$) interaction, whether or not there is a bound state of Ξ - Ξ is being discussed.

In high-energy heavy-ion collisions, a large number of particles including (multi-) strangeness are produced, which allows us to study those interactions via femtoscopic measurements with better precision. The correlation function is affected by strong interaction, quantum statistics, and Coulomb interaction in low relative momentum of particle pairs of interest.

In this poster, the status of measurements of Λ - Λ and Ξ - Ξ correlation functions in Au+Au collisions at $\sqrt{s_{\text{NN}}} = 200$ GeV at RHIC-STAR will be reported.

References

- [1] T. Inoue *et al.* (HAL QCD Collaboration), Nucl. Phys. A881, 28 (2012)
- [2] H. Takahashi *et al.*, Phys. Rev. Lett. 87, 212502 (2001)