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Measurement of d-Lambda correlation in 3 GeV Au+Au collisions at STAR

Heavy-ion collisions offer a new way to understand hypernuclei structure and hyperon-nucleon (Y-N) interaction. Recent hypernuclei measurements have focused on lifetime, binding energy, production yield, and collective flow in heavy-ion collisions. These measurements have increased interest in studying the structure of hypernuclei and their production mechanisms.

Meanwhile, femtoscopy has been extensively employed to investigate the interaction and collision dynamics of mesons and nucleons, providing crucial insights into the space-time evolution of the emission source and final state interaction effects. Thus, the application of this technique to the study of the correlation between nuclei and hyperons, such as the deuteron and Λ, represents a novel approach to comprehending the structure of light hypernuclei, as well as to improving our understanding of the inner structure and equation of state of neutron stars through heavy-ion collision experiments.

In this talk, we present the first measurement of d-Λ correlation in the heavy-ion collision experiments with $\sqrt{s_{\rm NN}} = 3$ GeV Au+Au collisions from Beam Energy Scan II by the STAR experiment at RHIC. The correlation functions are analyzed within the Lednicky-Lyuboshitz formalism in order to characterize the emission source size, the scattering length, and the effective range of d-Λ interactions. Physics implications on the hypernuclei structure (e.g. binding energy) will be discussed.

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