Measurements of p-Ξ^- Correlation Functions in Au+Au Collisions from STAR Beam Energy Scan II

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Abstract

Two-particle correlation analyses provide a powerful tool for studying the spatial and temporal characteristics of particle-emitting sources and final state interactions in high-energy nuclear collisions. In particular, the particle emission source size and hyperon-nucleon (Y-N) interaction parameters, such as the scattering length f_0 and effective range d_0, are key to understanding the freeze-out dynamics and Y-N interactions in such collisions.

In this poster, we present measurements of p-Ξ^- correlation functions in Au+Au collisions over a broad energy range, from $\sqrt{s_{\rm NN}} = 3.0$ to 27 GeV, using data from STAR's Beam Energy Scan II. The correlation functions are analyzed within the Lednicky-Lyuboshitz formalism, allowing us to extract the f_0 and d_0 parameters, which will be compared with recent calculations from Lattice QCD and effective theory models. Additionally, we will show the energy dependence of the extracted source size. The results will also be compared with simulations from the UrQMD hadronic transport model combined with the CRAB afterburner.

References

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