Measurements of pp, $p\Lambda$, $p\Xi^-$ Correlation Functions at $\sqrt{s_{NN}} = 3$ GeV Au+Au Collisions at RHIC-STAR

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Abstract

Two particle correlation function in heavy ion collisions mainly depends on the phase space of the emitting source, and the final-state interactions. So it is widely used to investigate the source size after collision, and also provide an effective experimental approach to study the nucleon-nucleon and hyperon-nucleon interactions, which are crucial to understand the inner structure of compact stars.

In this work, we will present the results of baryon correlation functions for the pairs of pp, $p\Lambda$, $p\Xi^-$ in Au+Au collisions at$\sqrt{s_{NN}} = 3$ GeV recorded by the fixed target program at STAR. The correlation functions are obtained after corrections for purity and feed-down effects and considering momentum resolution, track merging and splitting effects. The source size r_G of different pairs for different centrality and strong interaction parameters scattering length f_0 and effective range d_0 of the pairs are extracted. UrQMD and CRAB models are used to calculate the correlation function theoretically to compare with the experimental result.