Measurement of proton-Λ and proton-Ξ^- Correlation Function in Au+Au Collisions from STAR Fixed-Target Experiment

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Abstract

Two particle correlation analysis are often used to study the spatial and temporal extents of the particle source in high-energy nuclear collisions. Information on the final state interactions amongst the particles under study can also be extracted from the measurement. For example, from the p-Λ and p-Ξ^- correlation functions, one could study the hyperon-nucleon (Y-N) interactions in such collisions. It is particularly interesting to study the dependence on the collision energy because freeze-out condition depends on energy. The STAR fixed-target program has enabled the investigation of the high baryon density region, with an energy reach extended from $\sqrt{s_{\mathrm{NN}}} = 7.7$ to 3 GeV.

In this poster, the first measurements of proton-Λ and proton-Ξ^- correlation function in Au + Au collisions at 3.2, 3.5 and 3.9 GeV with the fixed-target mode from STAR will be presented. This results will be compared with data from 3 GeV Au + Au collisions ($\mu_{\mathrm{B}} = 750$ MeV) and data from LHC energies (μ_{B} is close to zero) as well as model calculation.