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Measurement of Proton- Ξ^- Correlation Function in Isobar Collisions at $\sqrt{s_{NN}} = 200$ GeV with the STAR Detector

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Femtoscopy is a powerful technique used to investigate the emission source and interaction potential between pairs of particles. The two-particle correlation function, which reveals valuable information about the space-time evolution of the emitting source and final state interaction, is the primary observable of interest. A detailed knowledge of hyperon-nucleon (Y-N) interaction is important for understanding the equation of state of neutron star. In high energy heavy-ion collisions, a large number of particles including hyperons are produced, which offers a great opportunity to study those interactions via femtoscopic measurements.

In this talk, we present the measurements of p- Ξ^- correlations with high statistics in Isobar collisions (Ru+Ru, Zr+Zr) at $\sqrt{s_{NN}} = 200$ GeV by the STAR experiment. By employing Lednicky-Lyuboshitz approach, the scattering length (f_0) and effective range (d_0) of proton and Ξ^- interactions are extracted. Results from Au+Au collisions at the same energy will be used for comparison. In addition, these parameters will be compared to those from Lattice QCD calculations.

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