

Measurements of Proton-Proton Correlation Function at High Baryon Density Region in Au+Au collisions

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1 The spatial-temporal extension and the final state interactions (FSI) between the
2 pair of particles of interest can be studied through the measurement of the two-particle
3 correlation function (CF) in high-energy nuclear collisions. In the past, most CF mea-
4 surements have focused on meson-meson pairs (e.g., pion-pion), while measurements for
5 baryon-baryon pairs are scarce. The FSI parameters are expected to be independent
6 of the measured collision system and dynamic region, which is important to study the
7 nucleon-nucleon and hyperon-nucleon interactions. Meanwhile the energy dependence
8 of the source-size for baryon-baryon pair at high baryon density region can provide an
9 unique insight on the study of QCD phase structure.

10 In this poster, we will present the measurements of proton-proton correlation functions
11 from Au+Au collisions at $\sqrt{s_{NN}} = 3.2\text{-}7.7$ GeV, with the STAR experiment. With
12 the Lednický-Lyuboshitz approach, source size parameters R_G , scattering length f_0 and
13 effective range d_0 are extracted from different collision centrality, rapidity and collision
14 energy. The proton-proton CF is simulated using the transport model UrQMD plus
15 interaction potential, and compared to the measured results.