

Production of Proton and Light Nuclei in Au+Au Collisions by RHIC-STAR in the High Baryon Density Region

Light nuclei are loosely bound objects with a few MeV binding energies. The systematic measurement of light nuclei production in heavy-ion collisions across a wide energy range is a valuable tool to probe the QCD phase structure and gain insight into the underlying production mechanism. In 2018, RHIC started the second phase of the beam energy scan program (BES-II). The STAR Fixed Target (FXT) program was proposed to achieve lower center-of-mass energies and higher baryon density regions. Up to now, the STAR experiment has recorded high statistics data at $\sqrt{s_{NN}} = 3 - 13.7$ GeV in Au+Au collisions.

In this poster, we will present the proton and light nuclei production in Au+Au collisions at $\sqrt{s_{NN}} = 3$ GeV (FXT) recorded by the STAR experiment. The analysis will include results from center to peripheral collisions, and span from mid-rapidity to target rapidity. The transverse momentum (p_T) spectra, coalescence parameters (B_A), particle ratios, and compound yield ratios will be shown and compared with other experiment groups for a wide range of energies.

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