Identified and strange particle distributions from STAR fixed-target program

Muhammad Usman Ashraf (for the STAR Collaboration)
Department of Engineering Physics, Tsinghua University, Beijing 100084, China

Abstract.

Many interesting results in Au+Au collisions at $\sqrt{s_{NN}}$ = 7.7–62.4 GeV, such as identified hadron anisotropy (v_1, v_2, v_3), kaon over pion ratios, and net-proton higher moments, from the RHIC Beam Energy Scan phase I (BES-I) program have motivated the investigation at even lower energy collisions below $\sqrt{s_{NN}}$ = 7.7 GeV. Recent detector upgrades to the STAR experiment improve the detector performance and acceptance for the Beam Energy Scan phase II (BES-II) program with greatly increased data statistics. The STAR fixed-target program extends the low energy reach from $\sqrt{s_{NN}}$ = 7.7 GeV to 3.0 GeV, corresponding to baryon chemical potential from 420 MeV to about 700 MeV. Comparison between the asymmetric system (Al+Au) and the symmetric system (Au+Au) provides valuable insights into baryon stopping, which is the key to understand the baryon chemical potential of the dense medium produced in heavy-ion collisions. Furthermore, in asymmetric Al+Au system, the peaks of the rapidity density distributions (dN/dy) are not aligned with the nucleon-nucleon center-of-mass rapidity. The magnitude of the peak shift varies with particle species and also with centrality and can serve as a measure of the baryon stopping.

In this poster, we will present results in Al (beam)+Au (target) collisions at $\sqrt{s_{NN}}$ = 4.9 GeV and Au+Au collisions at $\sqrt{s_{NN}}$ = 3.0 GeV, from the STAR fixed-target program in BES-II. These results include the transverse mass spectra, rapidity density distributions, particle ratios and centrality dependence of charged and strange hadrons. The data will be compared with previously published results from different AGS experiments.