

Baryon Stopping and Associated Production of Mesons in Au+Au Collisions at $\sqrt{s_{NN}} = 3.0$ GeV at STAR

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Abstract

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2 Charged particles in heavy-ion collisions have various production mechanisms, such as
3 thermal and associated production, and the importance of each changes with the collision
4 energy. Studying the yields of charged particles provides a way to investigate the properties
5 of the produced QCD matter in heavy-ion collisions and the various production mechanisms.
6 The RHIC Beam Energy Scan (BES) programs cover a wide range of energies, including
7 the transition from a hadronic dominated medium to a partonic dominated medium. The
8 recently completed BES-II program was designed to improve and extend upon the results
9 from the BES-I program. Of particular interest is the high baryon density region which is
10 accessible through the STAR fixed-target program, extending the energy reach from $\sqrt{s_{NN}} =$
11 7.7 GeV down to $\sqrt{s_{NN}} = 3.0$ GeV. This presentation reports on measurements of charged
12 particle production in Au+Au collisions at $\sqrt{s_{NN}} = 3.0$ GeV. Measurements of the proton
13 stopping will be presented in addition to measurements of the production of K^+ in association
14 with the Λ baryon. Invariant yields and rapidity density distributions of π^\pm , K^\pm , and p
15 will also be presented, which will help to unravel the relative importance of the different
16 particle production mechanisms. These measurements provide an in-depth study of the various
17 production mechanisms for light hadrons and probe unique properties of the high baryon
18 density medium produced in these low energy collisions.