

Charged Particle Distributions in Au+Au Collisions at $\sqrt{s_{NN}} = 3.0$ GeV at STAR

Benjamin Kimelman
(For the STAR Collaboration)

University of California - Davis
bkimelman@ucdavis.edu

Abstract

1
2 The RHIC Beam Energy Scan phase I (BES-I) program provided a detailed study of
3 nuclear matter over a wide range of energies. Below $\sqrt{s_{NN}} < 19.6$ GeV, interesting results
4 were shown in hadron azimuthal anisotropies, particle ratios, and net-proton higher moments
5 which motivate the Beam Energy Scan phase II (BES-II). Compared to BES-I, BES-II has had
6 improvements including increased statistics by a factor of 10 to 20 for each energy, improved
7 acceptance from upgrades to the STAR experiment, and an extension of the energy reach from
8 $\sqrt{s_{NN}} = 7.7$ GeV to $\sqrt{s_{NN}} = 3.0$ GeV with the STAR fixed-target program. This talk will
9 present results from the lowest fixed target energy to be studied in BES-II including transverse
10 mass spectra, rapidity density distributions, and particle ratios for charged hadrons. These
11 results are analyzed with a chemical equilibrium model to determine the chemical temperature
12 and potential at freeze-out. At low energy, produced particles are sensitive to a Coulomb
13 potential from a net positive source at low momentum which modifies the transverse mass
14 spectra. The π^+/π^- ratio and extracted Coulomb potential will also be presented. The
15 contribution of the delta resonance to the π yields will be discussed, along with the production
16 of K in association with the Λ . These new data are compared to previously published results
17 from experiments at the AGS.