

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

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Abstract

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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 These results motivate the Beam Energy Scan phase II (BES-II). Compared to BES-I, BES-II
6 will have improvements including increased statistics by a factor of 10 to 20 for each energy,
7 improved acceptance from upgrades to the STAR experiment, and an extension of the energy
8 reach from $\sqrt{s_{NN}} = 7.7$ GeV to $\sqrt{s_{NN}} = 3.0$ GeV with the STAR fixed-target program.
9 This talk will present results from the lowest fixed target energy to be studied in BES-II
10 including transverse mass spectra, rapidity density distributions, particle ratios, and centrality
11 dependence for charged hadrons. These results are analyzed with a chemical equilibrium
12 model to determine the chemical temperature and potential at freeze-out. The pion ratio and
13 Coulomb potential will also be presented. At low energy, produced particles are sensitive to a
14 Coulomb potential from a net positive source at low momenta which modifies the transverse
15 mass spectra. These new data are compared to previously published results from experiments
16 at the AGS.