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Nuclear Experiment

STAR experiment results from the beam energy scan program at RHIC

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We present the first results using the STAR detector from the Beam Energy Scan (BES) program at the Relativistic Heavy-Ion Collider (RHIC). In this program, Au ion collisions at center of mass energies ($\sqrt{s_{NN}}$) of 7.7, 11.5 and 39 GeV allowed RHIC to extend the study of the QCD phase diagram from baryonic chemical potential values of 20 MeV to about 400 MeV. For the high net-baryon density matter at midrapidity, formed in these collisions, we report several interesting measurements. These include the observation of difference between anti-particle and particle elliptic flow, disappearance of the difference in dynamical azimuthal correlations with respect to event plane between same and opposite signed charged particles, change in slope of eccentricity at freeze-out and directed flow of protons as a function of $\sqrt{s_{NN}}$ and the deviation of higher order fluctuations from hadron resonance gas and Poissonian expectations. Possible interpretations of these observations are also discussed.

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