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Study of the Bulk Properties of the System Formed in Au+Au Collisions at $\sqrt{s_{NN}}$ = 14.5 GeV Using the STAR Detector at RHIC

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The main goal of the Beam Energy Scan (BES) Program at RHIC is to study the structure of the QCD phase diagram. In the years 2010 and 2011 data were collected for Au+Au collisions at $\sqrt{s_{NN}}$ = 7.7, 11.5, 19.6, 27, 39, 62.4, and 200 GeV. The corresponding baryonic chemical potential (μ_B) ranged from 420 to 20 MeV, leaving a gap of about 100 MeV in the phase space between μ_B = 315 MeV and 205 MeV for $\sqrt{s_{NN}}$ = 11.5 and 19.6 GeV, respectively. This happened to be the region of phase space where several interesting observations related to bulk properties of the system were reported. In the year 2014, Au+Au collisions at 14.5 GeV (corresponding μ_B for central collisions $\approx$ 264 MeV) were recorded by the STAR detector.

In this talk we present the first measurements of the transverse momentum spectra and azimuthal anisotropy of all the identified hadrons (π^+, π^-, K^+, K^-, $p(\bar{p})$, K^0_s, $\Lambda(\bar{\Lambda})$, and ϕ) at midrapidity in Au+Au collisions at 14.5 GeV for various collision centralities and compare the results with those from other BES energies. The bulk properties of the system, like the chemical freeze-out conditions and the collectivity extracted from the measured yields of the produced particles will also be presented. A clear centrality dependence in the difference between baryon and anti-baryon elliptic flow is observed. Furthermore, the new data taken at 14.5 GeV show that the baryon-meson splitting of elliptic flow is of the similar order as for the higher beam energies. The energy and centrality dependence of the measurements on the bulk properties will be discussed systematically.

On behalf of collaboration:

STAR

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