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Energy Dependence of Moments of Net-Kaon Multiplicity Distributions at STAR

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One of the main goals of the RHIC Beam Energy Scan (BES) program is to search for the QCD critical point. By varying the colliding energy, we can access different regions (T , μ_B) on the QCD phase diagram. Fluctuations of conserved quantities such as baryon number (B), charge number (C), and strangeness number (S), are sensitive to the correlation length and can be used to probe non-gaussian fluctuations near the critical point. Experimentally, higher moments of the multiplicity distributions have been used to search for the QCD critical point in heavy-ion collisions.

In this talk, I will present the recent STAR results of the higher moments of the mid-rapidity ($|y| < 0.5$) net-kaon multiplicity distributions in Au+Au collisions at $\sqrt{s_{NN}} = 7.7, 11.5, 14.5, 19.6, 27, 39, 62.4$, and 200 GeV. The data were collected during the first phase of the RHIC BES program by the STAR experiment. Centrality and energy dependence of cumulants up to the fourth order as well as their ratios will be shown. Furthermore, the rapidity and p_T dependence of the ratios will be presented. Comparisons with baseline calculations (Poisson) and non-critical point models (UrQMD) will be discussed as well.

On behalf of collaboration:

STAR

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