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Higher Moments of Net-proton, Net-charge Multiplicity Distributions at RHIC

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Experimental confirmation of the QCD critical point is an excellent test of QCD theory in the non-perturbative region and a milestone of exploring the QCD phase diagram. It is one of the main goals of the RHIC Beam Energy Scan (BES) program. Due to the high sensitivity to the correlation length [1] of the dynamical system and directly connected to the susceptibilities in theoretical calculations, for example, the Lattice Gauge Theory (LGT) calculations [2], higher moments of multiplicity distributions have been applied to search for the QCD critical point in the heavy-ion collision experiment.

In this talk, we will present the recently published experimental results of net-proton and net-charge [3] from RHIC BES data. We will discuss the deviations of the data from Poisson, binomial baselines as well as the implications. In addition, the results from HRG, AMPT and UrQMD model will be compared with the experimental results.

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