

Mix-ratios of Higher Order Moments of Proton and Kaon as a baseline of QCD Critical Point search at RHIC

One of the main goals of the RHIC Beam Energy Scan program is to search for the QCD critical point (CP) in the QCD phase diagram. Non-monotonic dependence of the ratios of the various moments of conserved (such as net-charge and net-baryon) number distributions with beam energy has been considered to be a signal for the CP. In addition to this, it has been recently proposed that a certain set of mix-ratios of these moments can be measured to validate the occurrence of critical phenomena. These ratios are constructed so as not to have any dependence on model parameters, including the correlation length. Their values after subtracting the statistical contribution should remain as unity even in presence of CP. Measurements of these mix-ratios are a vital step towards establishing a complete set of observables for the critical point program at RHIC. In this poster, we will present the preliminary results of these mix-ratios using event-by-event proton and kaon multiplicity at mid-rapidity measured in Au+Au collisions at

$\sqrt{s_{NN}} = 7.7, 11.5, 39$ and 200 GeV by the STAR experiment at RHIC. It has been observed that most of these mix-ratios are unity as a function of either the beam energy or the collision centrality.

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