

Longitudinal density correlations in Au+Au collisions at $\sqrt{s_{NN}} = 200\text{GeV}$

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Abstract

One of the most important tasks for the heavy-ion experiment at RHIC is to identify the QCD phase boundary. It can be carried out by scanning several sensitive observables, which are related to the thermodynamic variables, with respect to the critical phenomena. The longitudinal density correlations of the produced matter in Au+Au collisions at $\sqrt{s_{NN}} = 200\text{GeV}$ as the thermodynamic variable has been measured at the PHENIX experiment [arXiv:0704.2894]. It has been extracted by the correlations among the produced charged particles via the measurement of the multiplicity density fluctuations. This observable corresponds to the susceptibility in the long wavelength limit. A possible indication on the divergence of the susceptibility was seen around the number of participant nucleons 90. In this talk, we will present the detailed results and discussions on the relationship to the critical phenomena based on the recent publication.