Measurement of Intermittency for Charged Particles in Au+Au Collisions at $\sqrt{s_{NN}} = 7.7 - 200$ GeV from STAR

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One of the main goals of RHIC beam energy scan program is to search for the signature of the QCD critical point in heavy-ion collisions. It is predicted that the local density fluctuations near critical point exhibit power-law scaling [1], which can be probed with a intermittency analysis of the scaled factorial moments (F_q) for charged particles [2]. The power-law behavior of q^{th} order scaled factorial moments can be expressed as: $F_q \sim (M^2)^{\phi_q}$, where M^2 is the number of equally sized cells in momentum space, and ϕ_q is the intermittency index. The scaling exponent, ν, related to the critical component can be derived from the ratio, ϕ_q/ϕ_2. The energy dependence of ν could be used to search for the signature of the QCD critical point [3]. Such measurement is actively being pursued by the NA49 and NA61 Collaborations in large and small collisions at $\sqrt{s_{NN}} = 17.3$ GeV [2]. The BES-I data allow STAR to carry out such measurement over a much broader energy range of$\sqrt{s_{NN}} = 7.7 - 200$ GeV. This talk present the collision-energy and centrality dependence of ϕ_q and ν of charged particles in Au+Au collisions measured by the STAR experiment. The physical implications of these results are discussed.

References

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