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A study of the charged particle density fluctutions in heavy-ion collisions at ultra-relativistic energies using EPOS4

The location of critical-point as per quantum chromodynamics (QCD) and the nature of phase transition is the subject of both theoretical and experimental studies. It is observed that local density fluctuations are directly related to the critical behaviour in QCD. As the system approaches phase transition, there is a divergence of the correlation length. The system becomes scale-invariant with particle correlation function having power-law with increasing bin resolution. The correlation function, within the contours of intermittency, used to study these spatial fluctuations is the normalized factorial moments (NFM) derived for the density of particles in the phase space bins. NFMs have essential properties of Poisson noise suppression and sensitivity to high density fluctuations. A two dimensional intermittency analysis is performed for the charged particles generated using EPOS4 in the (η, ϕ) phase space within the acceptance region of central barrel detector of the ALICE experiment at LHC, CERN. Scaling of NFM with number of bins, termed as intermittency, has been observed for the charged particles produced in the recent collider experiments. Here we report on the observations from a similar analysis performed for the charged particles generated in the heavy-ion collision events with EPOS4.

Category

Theory

Collaboration (if applicable)

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