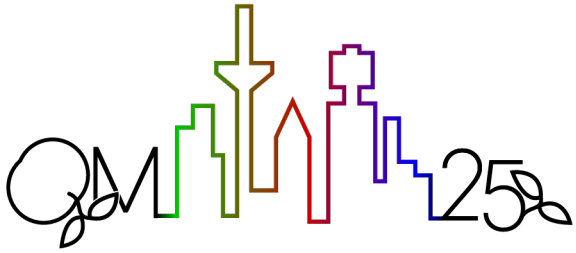

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Local multiplicity fluctuations in the charged particles produced in Xe–Xe collisions at $\sqrt{s_{NN}} = 5.44$ TeV with ALICE

A two-dimensional intermittency analysis performed for the charged particles produced in (η, φ) phase space during Xe–Xe collisions at $\sqrt{s_{\rm NN}}$ = 5.44 TeV recorded with the ALICE detector at LHC is presented. A well-known characteristic of the critical behaviour of the system undergoing phase transition is that it shows fluctuations of all scales. Local multiplicity fluctuations are analyzed using normalized factorial moments (NFM) $F_{\rm q}$ for $q = 2$, 3, 4 and 5. For the systems with dynamical fluctuations $F_{\rm q}$ shows scaling behaviour with increasing numbers of bins M whereas scaling is also characteristic of the systems with self-similar and fractal nature. $F_{\rm q}$ moments show scaling behaviour as the binning in the phase space region increases.

For the second-order phase transition in the Ginzburg-Landau formalism $F_{\rm q}$ for $q > 2$ shows a linear dependence on the second-order normalized factorial moments (F_2), termed as F-scaling. The scaling exponent ν, which quantifies the fluctuations in the particle density distributions, was determined for various $p_{\rm T}$ intervals and bin widths in the soft-$p_{\rm T}$ region. Observations and results from this study and comparison with Pb–Pb results at LHC energies will be discussed.

Category

Experiment

Collaboration (if applicable)

ALICE

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