

Event-by-event fluctuations of mean transverse momentum in Pb–Pb and Xe–Xe collisions with ALICE

Event-by-event fluctuations of mean transverse momentum, $\langle p_T \rangle$, help to characterize the properties of the bulk of the system created in ultrarelativistic heavy-ion collisions, called the quark-gluon plasma (QGP). The fluctuations are closely related to the dynamics of the phase transition from the QGP to a hadron gas.

In this contribution, event-by-event fluctuations of $\langle p_T \rangle$ of charged particles produced in Pb–Pb and Xe–Xe collisions at $\sqrt{s_{NN}} = 5.02$ TeV and $\sqrt{s_{NN}} = 5.44$ TeV, respectively, are studied as a function of the charged-particle multiplicity using the ALICE detector at the LHC. Non-statistical fluctuations are observed in both collision systems, which indicate correlated particle emission. The central collisions show a significant reduction of these fluctuations in comparison to peripheral collisions indicating a dilution scenario that cannot be explained just by the superposition of partially independent particle-emitting sources. The results in Pb–Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV are in qualitative agreement with previous measurements in Pb–Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV. A comparison with the HIJING model is also discussed.

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