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Event-by-event mean p_T fluctuations in Pb-Pb collisions at LHC Run 3 with ALICE

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Event-by-event mean transverse momentum fluctuations of relativistic charged particles produced in Pb–Pb collisions at $\sqrt{s}_{NN} = 5.36$ TeV are studied in terms of normalized two-particle correlator $\sqrt{C_m}/\langle\langle p_T \rangle\rangle$. Data collected using the ALICE detector during Run 3 are analyzed for this purpose and the results are compared with those reported earlier for large collision systems. The findings reveal presence of dynamical fluctuations. It is also observed that the correlation strength decreases monotonically with increasing charged-particle density. The observed trend of $\sqrt{C_m}/\langle\langle p_T \rangle\rangle$ with $\langle dN_{ch}/d\eta \rangle$ is found to be in qualitative agreement with the previous measurements in Pb–Pb collisions at $\sqrt{s_{NN}} = 2.76$ and 5.02 TeV. Cumulative values of $\sqrt{C_m}/\langle\langle p_T \rangle\rangle$ for the 0-5 % central collisions are also obtained and compared with those reported for Pb–Pb, Au–Au and Pb–Au collisions by the ALICE, STAR, and CERES Collaborations.

Author: SINGH, Sweta (Aligarh Muslim University (IN))

Presenter: SINGH, Sweta (Aligarh Muslim University (IN))

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