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Multiplicity dependence study of the pseudorapidity density distribution of charged particles in pp collisions with ALICE

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In this contribution, we report on the multiplicity dependence of the pseudorapidity density distribution of charged particles in proton-proton (pp) collisions at $\sqrt{s} = 5, 7$ and at 13 TeV with the ALICE experiment.

The measurements rely on track segments reconstructed with the Silicon Pixel Detector in the kinematic region $|\eta| < 1.8$. Results are presented for three different event classes: inelastic (INEL), inelastic events with at least one charged particle in the central region $|\eta| < 1$ (INEL > 0), and non-single-diffractive (NSD) events for pp collisions at $\sqrt{s} = 5.02$ TeV. The measurements are shown for different multiplicity slices, defined by a forward multiplicity estimator and a central multiplicity estimator, which manifest different physics. To better understand the role of collective effects that have been recently observed in pp collisions, the evolution of the shapes of the pseudorapidity density distributions at very high multiplicities is presented for pp collisions at $\sqrt{s} = 13$ TeV using data collected with high-multiplicity triggers.

The results are compared to the predictions from the QCD-inspired Monte Carlo (MC) event generators PYTHIA and DIPSY as well as to expectations from the hydrodynamically treated MC event generator EPOS LHC.

Content type

Experiment

Collaboration

ALICE

Centralised submission by Collaboration

Presenter name already specified

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