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Particle production and collective flow measurements with CMS Run 3 PbPb data (remote)

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The pseudorapidity distributions and anisotropic flow coefficients of charged particles produced in heavy ion collisions are key observables that characterize the initial conditions and subsequent hydrodynamic evolution of the quark-gluon plasma. Recent LHC Run 3 lead-lead (PbPb) data collected at a center-of-mass per nucleon pair of $\sqrt{s_{NN}} = 5.36$ TeV allow the study of these effects at a record collision energy. We present the first measurements of the midrapidity charged particle $dN/d\eta$ as a function of collision centrality, as well as the Fourier harmonics, v_2 and v_3 , with two- and four-particle correlations in PbPb collisions recorded at $\sqrt{s_{NN}} = 5.36$ TeV with the CMS experiment. Taken together, these measurements constrain models of the collision-energy and centrality-dependence of charged particle production, and also shed light on the initial collision geometry and importance of event-by-event fluctuations. These data are compared to similar measurements at different energies, including PbPb collisions at $\sqrt{s_{NN}} = 5.02$ and xenon-xenon collisions at $\sqrt{s_{NN}} = 5.44$ TeV.

Category

Experiment

Collaboration (if applicable)

CMS

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