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Measurements of azimuthal anisotropy of charged particles in Pb+Pb collisions with the ATLAS detector

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The initial QGP geometry of the quark-gluon plasma (QGP) is manifested as azimuthal anisotropy in final state particles of a nuclear collision in the plane transverse to the beam direction. This study measures the Fourier coefficients v_2 and higher order harmonics of charged particle distribution in Pb+Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV with 2018 data collected by the ATLAS experiment. The measurements utilize the scalar product method and multiparticle cumulants method to probe momentum dependence of response to initial-state fluctuations. With improved statistics, the 2018 data provides an opportunity to explore higher momentum regimes and higher order harmonics than current measurements and a deeper understanding of the role of fluctuations. The results are compared with existing measurements for charged particles and jets and will provide new information about the path length dependence of jet quenching.

Category

Experiment

Collaboration (if applicable)

ATLAS Collaboration

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