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Exploring jet quenching effects via di-hadron correlations in 13 TeV proton-proton collisions with ALICE

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In high-energy collider physics, one of the most important questions is whether quark-gluon plasma (QGP) is formed in pp collisions. Recently, flow-like behaviours have been found in high-multiplicity pp collisions implying collectivity. Stronger evidence for the QGP formation in pp collisions would be signatures of jet quenching, which has not yet been observed. In this contribution, the results of jet quenching studies in pp collisions at $\sqrt{s_{\rm NN}} = 13$ TeV with di-hadron correlations will be presented. The correlations are measured for various $p_{\rm T}$ intervals as a function of charged-particle multiplicity. The results at high-multiplicity (HM) events show an azimuthal narrowing of the jets compared to the minimum bias (MB) events, although the difference between HM and MB becomes smaller at higher $p_{\rm T}$ intervals where the jets are narrower. These findings suggest a potential bias in the flow extraction, called the low-multiplicity (LM) template method, which assumes that the jet shape does not change between HM and LM events. The measurements are compared with various model calculations such as PYTHIA8, PYTHIA String shoving, EPOS, AMPT and JETSCAPE. Additionally, we report on the jet fragmentation functions in HM and MB events as well as preliminary results of di-hadron correlations from the LHC Run 3 pp collisions. Furthermore, the implications and interpretations of the results are discussed.

Category

Experiment

Collaboration

ALICE

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