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Search for jet quenching effects in high-multiplicity proton-proton collisions at √s = 13 TeV

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QCD jets are modified ("quenched") by their interactions with the quark-gluon plasma (QGP) formed in high-energy nuclear collisions. The measurement of jet quenching in small collision systems can tell us about the limits of QGP formation and the nature of equilibration in QCD, but to date no significant jet quenching has been observed in small systems. In this talk, the ALICE Collaboration reports results of a novel approach to jet-quenching measurements in high-multiplicity pp collisions at √s = 13 TeV, searching for modification of di-jet azimuthal acoplanarity measured by the semi-inclusive distribution of jets recoiling from a high-p T hadron. Charged-jet reconstruction is carried out using the anti-k T algorithm with R = 0.4 and a data-driven statistical method is used to correct the measured jet yield for uncorrelated background, which includes multi-partonic interactions. High-multiplicity (HM) pp events are selected based on charged-particle multiplicity registered in forward scintillator detectors and their acoplanarity distributions are compared to that for Minimum Bias (MB) events. Significant azimuthal broadening is observed in HM collisions, consistent with jet quenching. However, qualitatively similar features are also seen in pp collisions generated by the PYTHIA Monte Carlo event generator which does not include the simulation of jet quenching or any other QGP effects. We will discuss the current status of this analysis and prospects to understand the origin of this striking phenomenon.

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