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Searching for jet quenching effect using high-multiplicity inclusive jet and h+jet semi-inclusive jet in pp collisions with ALICE

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Several new features have been recently observed in high-multiplicity small collision systems that are reminiscent of the observations attributed to the creation of a quark-gluon plasma, QGP, in Pb-Pb collisions. These include long-range angular correlations on the near and away side of two-particle correlations, non-vanishing second order Fourier coefficients in multiparticle cumulant studies, and the baryon-to-meson ratio enhancement in high-multiplicity pp and p-Pb collisions. However, jet quenching effects in small systems have not yet been observed, and quantifying or setting limits on the magnitude of jet quenching in small systems is a key element in understanding the limits of QGP formation. In this talk we present a search for jet quenching effects in pp collisions as function of event multiplicity based on on two jet observables: inclusive p_{T}-differential jet cross sections, and the semi-inclusive yield of jets recoiling from a high-p_{T} hadron. Both measurements are carried out differentially in event multiplicity, which varies the size of the collision system. Jets are reconstructed from charged particles using the anti-k_{T} algorithm, the R-dependent inclusive jet cross section is compared to pQCD calculations. To search for jet quenching effects, the shape of the inclusive jet yield in different multiplicity intervals is compared to the one obtained in minimum bias (MB) events. The jet yield increases as a function of charged-particle multiplicity, which is similar to the one observed from soft sectors based on transverse spherocity. In the semi-inclusive analysis, the recoil jet acoplanarity distributions are measured in high multiplicity (HM) events and MB events. The acoplanarity distributions in HM events exhibit a marked suppression and broadening when compared to the corresponding distributions obtained from MB events. Its origin is elucidated by comparison to model calculations, with potential implications for the larger LHC small-systems program.

In-person participation

Yes

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