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Jet properties in {\it p+p} and their possible modification in cold nuclear matter in STAR

The intrinsic transverse momentum of partons and the possible initial and final state gluon radiation associated with hard scatterings give rise to an acoplanarity of di-jets which depends on both the Q^2 of hard scatterings and the center of mass energy of the colliding beams. Multiple scatterings of the hard scattered partons in cold nuclear matter may also alter the measured acoplanarity when compared to those in {\it p+p}. Studies in central {\it d+Au} collisions are therefore vital to disentangle medium-induced k_t broadening from initial state nuclear effects and any potential broadening due to jet quenching in the medium produced in heavy-ion collisions. While full jet reconstruction is a direct way to study such acoplanarities, di-hadron correlations with respect to a high momentum leading particle can also be utilized as a complementary tool.

Two quantities commonly used to characterize the properties of jets are j_t, the transverse momentum of the jet fragments relative to the jet axis, and k_t, the transverse component of the momentum of the hard scattered partons. Measurements of the jet parameters, $\sqrt{\langle j_t^2 \rangle}$ and $\sqrt{\langle k_t^2 \rangle}$ at STAR in {\it p+p} collisions at $\sqrt{s}$ = 62.4, 200 and 500 GeV extracted from di-hadron correlations are presented. π^0 (E_t = 6.5 to 18.5 GeV) and charged tracks (p_t = 3.0-8.5 GeV/c) are used as trigger particles in these analyses. The results extracted at $\sqrt{s}$ = 200 GeV will be compared to those using full jet reconstruction and contrasted to measurements made for several {\it d+Au} centralities.

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