

# Jet-hadron and di-hadron correlations in pp and Pb-Pb with studies relative to the event plane at the LHC with ALICE

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In relativistic heavy-ion collisions at the Large Hadron Collider (LHC), conditions are met to produce a hot, dense and strongly interacting medium known as the Quark Gluon Plasma (QGP). Quarks and gluons from incoming nuclei collide to produce partons at high momenta early in the collision. By fragmenting into collimated sprays of hadrons, these partons form “jets”. Within the framework of perturbative QCD, jet production is well understood in pp collisions and can be used as a baseline reference for comparing to heavy ion collision systems when studying jet quenching. One approach is to measure the azimuthal correlations of a trigger and the associated hadrons in the event. For a jet trigger, these are known as jet-hadron correlations, while a hadron trigger leads to di-hadron correlations. Such correlations are examined in transverse momentum bins of the trigger, transverse momentum bins of the associated hadrons, and studied as a function of collision centrality. The correlations are expected to be sensitive to broadening and softening of the associated recoil jet due to jet quenching. We present azimuthal jet-hadron correlations constructed from a trigger  $R=0.2$  full (charged + neutral) jet, which is correlated with charged hadrons. In an effort to control the path length of the recoil jet and reduce the impact of the background, jets are required to pass a leading constituent cut and are reconstructed using only high energy and momentum constituents. We present the current status of this analysis in Pb–Pb collisions at  $\sqrt{s_{NN}} = 2.76$  TeV. To further probe the path length dependence, we will also present Pb–Pb jets relative to the event plane, which include a highly robust and precise background subtraction method to remove the complex, flow dominated, heavy ion background. The jet yields and widths will be presented for the Pb–Pb analyses and compared to our baseline measurements in pp collisions. In addition, yields and widths for di-hadron correlations in Pb–Pb will be presented.

## Preferred Track

Jets and High pT Hadrons

## Collaboration

ALICE

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