

Constraining the color-charge effects of energy loss with jet axis-based substructure studies in PbPb collisions at 5.02 TeV

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Jets are established tools for studies of the Quark Gluon Plasma (QGP) properties. In this talk, we present a new measurement of the jet substructure modification via the observable ΔR_{axis} , characterizing the distance between two types of jet axis constructed with the same jet constituents. We use E-scheme and WTA axes with different sensitivity to soft and semi-hard medium-induced radiation. The reported fully unfolded distributions present the first CMS measurements of the angular separation between such axes for anti- k_T $R = 0.4$ jets from 5.02 PbPb collisions for several collision centralities and jet p_T intervals. Significant modifications of ΔR_{axis} distributions are observed in central compared to peripheral collisions, indicating progressive narrowing of angular correlations that could be attributed to QGP-induced modifications of the internal jet structure. Alternatively, the narrowing could also be produced by the predicted color-charge dependence of energy loss, causing a larger migration of gluon-initiated jets towards lower final state energies. Assuming the modification is attributed to the difference in the quark/gluon energy loss, we provide complementary findings on gluon fraction limits from the MC-based template fit to the fully unfolded data. The new measurements access the jet substructure in the previously unassessed kinematic domain and provide new limits of color charge dependence of energy loss.

Category

Experiment

Collaboration

CMS

Primary author: Mr PRADHAN, Raghunath (University of Illinois at Chicago (US))

Presenter: Mr PRADHAN, Raghunath (University of Illinois at Chicago (US))

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