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Jet substructure measurements with large radius jets with ATLAS

Jet substructure measurements in heavy-ion collisions offer vital insights into the dynamics of jet quenching within the hot and dense QCD medium generated in these events. In this talk, we present new results from the ATLAS Collaboration on jet suppression and substructure using the Soft-Drop grooming technique in Pb+Pb and pp collisions at $\sqrt{s_{\text{NN}}} = 5.02$ TeV. The study explores jet splitting across a broad range of angles for large-radius jets $R = 1.0$, using charged particles to achieve high precision, providing access to small angular separations. This work unifies two previously published ATLAS analyses on small- and large- R jets, providing a more comprehensive view of jet substructure. The degree of jet suppression is characterized by the nuclear modification factor R_{AA} , presented as a function of jet transverse momentum p_{T} , the opening angle of the hardest internal splitting r_{g} , and the transverse momentum scale $\sqrt{d_{12}}$. By comparing these results with theoretical models, we deepen our understanding of jet quenching mechanisms, explore the properties of the QCD medium, and challenge current theoretical frameworks in heavy-ion collisions.

Category

Experiment

Collaboration (if applicable)

ATLAS Collaboration

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