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Measurements of the substructure and radius dependence of jet quenching in PbPb collisions

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Measuring the jet substructure in heavy-ion collisions provides exciting new opportunities to study detailed aspects of the dynamics of jet quenching in the hot and dense QCD medium created in these collisions. In this talk, we present new comprehensive ATLAS measurements of jet suppression and substructure performed using various jet radii and grooming techniques. New measurements of inclusive jet suppression (R_{AA}) in heavy-ion collisions are presented for jets reconstructed with different radii ($R=0.2, 0.3, 0.4, 0.6, 0.8$ and 1.0) in Pb+Pb and pp collisions at $\sqrt{s_{NN}} = 5.02$ TeV. We will also present new results of the jet substructure which use Soft-Drop grooming procedure to identify the hardest parton splitting in the jet. The measurements are performed using different jet constituents such as charged tracks, smaller R calorimeter jets, and novel objects reconstructed using tracker and calorimeter information. The jet suppression is characterized using R_{AA} and presented as a function of its transverse momentum (p_T), the angle of the hardest splitting (r_g), and the corresponding transverse momentum scale ($\sqrt{d_{12}}$). These new measurements, along with theory comparisons, will elucidate the mechanisms of jet suppression, medium effects, and energy recovery in the QCD medium.

Category

Experiment

Collaboration (if applicable)

ATLAS Collaboration

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