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ATLAS measurements of b -jet suppression and heavy-flavor azimuthal correlations in 5.02 TeV Pb+Pb collisions

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The suppression of jets in heavy-ion collisions can provide detailed information about the hot, dense plasma formed in these collisions at the LHC. Jet quenching in heavy-ion collisions is expected to depend on the mass of the fragmenting parton. For light partons, energy loss via gluon bremsstrahlung is expected to dominate, while for heavy-quark-initiated jets, collisional energy loss may play a more important role. This energy loss mechanism can be studied by measuring differences in the suppression of b -tagged and inclusive jets in pp and Pb+Pb collisions. Besides the b -tagged jet measurements, an alternative method for probing the interactions of heavy quarks with the plasma is the study of the correlations between heavy-quark pairs, which is sensitive to the relative importance of collisional versus radiative scattering processes. In this talk, we report new ATLAS measurements of b -tagged and inclusive jet production as well as the measurement of the yield of correlated muon pairs from heavy-flavor decays in Pb+Pb and pp collisions at $\sqrt{s_{NN}} = 5.02$ TeV. For b -tagged and inclusive jet, the transverse momentum distributions in Pb+Pb and pp collisions, as well as the nuclear modification factors, R_{AA} , in Pb+Pb collisions, are presented together with comparisons to theoretical calculations. The measurement of correlated muon pairs from heavy-flavor decays includes per-event yields, scaled by the nuclear thickness function, T_{AA} will be discussed. Detailed studies of how the shape of the correlation in azimuthal-angle separation between the two muons changes from peripheral to central Pb+Pb collisions and comparison to the corresponding measurements in pp collisions are also presented.

Category

Experiment

Collaboration (if applicable)

ATLAS Collaboration

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