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Substructures of heavy flavor jets in pp and Pb+Pb collisions at $\sqrt{s} = 5.02 \sim \text{TeV}$

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Groomed jet substructure measurements, the momentum splitting fraction z_g and the groomed jet radius R_g , for inclusive, D^0 -tagged and B^0 -tagged jets in pp and central Pb+Pb collisions at $\sqrt{s} = 5.02 \text{ TeV}$ are investigated. Theoretical results for light-quark initiated and gluon initiated jets are provided as references though experimentally indistinguishable for now. Charged jets are constrained in a relative low transverse momentum interval $15 \leq p_T^{\text{jet ch}} < 30 \text{ GeV}/c$ where the QCD emissions are sensitive to mass effects. The mass hierarchy manifests in z_g distributions in both parton showering and jet quenching indicating steeper splitting functions of heavier partons. The flavour differences induced by Casimir factors do not contribute to z_g distributions. Balanced splittings are suppressed due to jet quenching effects. The competition between flavor effects and mass effects to emission-angle distributions is directly observed for the first time. In both pp and Pb+Pb collisions, the mass hierarchy in R_g of inclusive, D^0 -tagged and B^0 -tagged jets is broken due to contributions from gluon-initiated jets. R_g shift to more broaden distributions due to medium-induced modifications.

Experiment/Theory

Theory/Phenomenology

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