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Measurements of the jet axis decorrelation and the groomed jet radius with photon-jet events in PbPb and pp collisions at the CMS experiment

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Previous analyses have shown a narrowing effect in the inclusive jet substructure. While this narrowing effect could be a result of jet quenching, it could also be caused due to a selection bias by which very quenched and broader jets are filtered out from the considered jet transverse momentum window. Photon-tagged jets, which correspond to a quark-enriched sample, can significantly reduce this potential selection bias and the effect coming from the change in the quark versus gluon fraction. They also allow for a selection on the degree of quenching. In this presentation, we show new photon-tagged jet results using proton-proton and lead-lead collisions at $\sqrt{s_{NN}} = 5.02$ TeV recorded with the CMS detector in 2017 and 2018, respectively. We present the decorrelation of jet axes calculated with energy-weighted and winner-take-all recombination schemes and compare the results between photon-tagged jets and inclusive jets. We also explore the modification of the groomed jet radius and angularity in PbPb collisions relative to pp collisions for jets that have lost up to 60% of their initial energy in the medium. The findings of these studies will contribute to a better understanding of the quark-gluon plasma and its properties.

Collaboration (if applicable)

Category

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