

Jet measurements by the CMS experiment in pp and PbPb collisions

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The energy loss of fast partons traversing the strongly interacting matter produced in high-energy nuclear collisions is one of the most interesting observables to probe the nature of the produced medium. The multi-purpose Compact Muon Solenoid (CMS) detector is well designed to measure these hard scattering processes with its high resolution calorimeters and high precision silicon tracker. Analyzing data from pp and PbPb collisions at a center-of-mass energy of 2.76 TeV parton energy loss is observed as a significant imbalance of dijet transverse momentum. To gain further understanding of the parton energy loss mechanism the redistribution of the quenched jet energy was studied using the transverse momentum balance of charged tracks projected onto the direction of the leading jet. In contrast to pp collisions, a large fraction the momentum balance for asymmetric jets is found to be carried by low momentum particles at large angular distance to the jet axis. Further the fragmentation functions for leading and subleading jets were reconstructed and are compared to model calculations and measurements in pp collisions. The results confirm and complement earlier CMS results based on calorimeter jets and yield a detailed picture of parton propagation in the hot QCD medium.

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