

Nuclear Experiment

Studies of Jet Quenching in PbPb collisions at CMS

Matthew Nguyen, for the CMS Collaboration

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Jets are an important tool to probe the hot, dense medium produced in ultra-relativistic heavy-ion collisions. At the collision energies available at the Large Hadron Collider (LHC), there is copious production of hard processes, such that high p_T jets may be differentiated from the heavy-ion underlying event. The multipurpose Compact Muon Solenoid (CMS) detector is well designed to measure hard scattering processes with its high quality calorimeters and high precision silicon tracker. Jet quenching has been studied in CMS in PbPb collisions at $\sqrt{s_{NN}} = 2.76$ TeV. As a function of centrality, dijet events with a high p_T leading jet were found to have an increasing momentum imbalance that was significantly larger than predicted by simulations. The angular distribution of jet fragmentation products has been explored by associating charged tracks with the jets measured in the calorimeters. By projecting the momenta of charged tracks onto the leading jet axis it is shown that the apparent momentum imbalance of the leading dijet pair can be recovered if low p_T tracks are considered. A large fraction of the balancing momentum carried by these soft particles is radiated at large angle relative to the jets.

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