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Jet substructure measurements in heavy-ion collisions

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High-energy collisions of heavy ions produce hot and dense strongly coupled matter, the so-called quarkgluon plasma (QGP). Jets, which are collimated particle sprays resulting from parton fragmentation, are modified by the QGP. The loss of jet momentum in the hot and dense medium, called jet quenching, was one of the first tell-tale signs of the presence of QGP. Jet quenching alone, however, is not enough to fully understand the energy loss mechanisms of jets within the plasma. With systematic jet substructure measurements, however, not only can we investigate the energy loss of the color charge, but we can also learn about the length scales that are resolvable by the QGP, or determine whether the plasma has an emergent quasiparticle structure. This contribution summarizes some of the most interesting results of the ATLAS, CMS, and ALICE experiments at the LHC, which contribute to answering these questions and extend our knowledge of the non-perturbative regime of quantum chromodynamics.

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