

Parton Shower Modification Studied with Jet Substructure in ALICE

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The heavy-ion physics program at the LHC aims at characterizing the high energy density, high temperature, deconfined partonic state of matter called Quark-Gluon Plasma. Hard probes are very useful tools to study the QGP properties since they are abundantly produced at the LHC energy regime, via hard scattering processes, and they experience the full evolution of the system, losing energy while passing through it. Eventually, these processes might also modify the parton fragmentation with respect to the vacuum case.

Jet measurements in Pb-Pb collisions allow one to study how the energy is lost by the partons that traverse the medium and redistribute it to other particles present in the QGP. Moreover, measurements of the jet substructure can bring insight on possible modifications, induced by the medium, on fragmentation of partons into jets and their virtuality evolution. Jet substructure is probed using jet shape observables, defined as different combinations of information that jets carry at different levels (energy profile, jet constituents distributions, clustering history, ...). The measurement of these observables in pp collisions is also an important test of QCD, to be compared with theoretical calculations and Monte Carlo generators.

A review of recent jet shape measurements performed with the ALICE detector in pp and Pb-Pb collisions will be presented.

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