

Separation of Quark and Gluon Jets using Angularities

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As a result of hadronization, the partons (quarks and gluons) are being observed via objects called jets which represent energy deposits in clustered calorimeters with associated jet reconstruction algorithm. This study investigates the determination of the initial parton from which the jet evolved based on five variables called angularities. Having a discriminant on an event-by-event basis could enhance the reach for Beyond Standard Model since most of the signal regions are being dominated by quarks and on the other hand in the Standard Model signal regions are populated mostly by gluons. The results provide an evaluation of the most suitable angularity with respect to the jet radius, beam energy, and trimming techniques, which can be the starting point for novel measurement at the Large Hadron Collider at CERN.

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