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The secondary vertex finding algorithm with the ATLAS detector

The ability to identify jets with b-hadrons is essential for many physics analyses at the LHC. In ATLAS there are several algorithms available to tag jets induced by b-hadrons. These jets can be identified by the presence of secondary decay vertices, which are usually displaced from the primary vertex, due to the lifetime of b- and c-hadrons inside a jet. The secondary vertex finding algorithm uses the information of these secondary decay vertices and it features two modes of operation, looking for a single or several secondary vertices in a jet. The application of these modes depend on the physics problem. The algorithm yields a high performance: the rate of reconstructing secondary vertices inside a b-jet is up to 80% for a single secondary vertex and up to 60% for more than one. The kinematic properties of the reconstructed vertices are propagated to several b-tagging algorithms used by ATLAS and their performance is compared. The poster will describe the algorithm and the information that can be exploited from reconstructing secondary vertices. The features and performance of the algorithm have been studied with simulated events at 13 TeV. The selected processes were chosen according to the mode of operation and the presence of high-pT jets.

Experimental Collaboration

ATLAS Collaboration

Presenter: HEER, Sebastian (University of Bonn (DE))

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