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Performance of Tau Identification and Associated Systematic Uncertainties in ATLAS

Identification and reconstruction of hadronically decaying tau leptons is essential for many physics studies at the LHC, e.g. searches for new physics like the Higgs boson. In about 35% of the cases tau leptons decay leptonically into electrons or muons and in about 65% of the cases they decay hadronically.
Since it is impossible to distinguish the leptonically decaying tau leptons from prompt electrons or muons, tau identification is only concerned with hadronically decaying tau leptons. Due to the overwhelming background of QCD jet production at the LHC, a strong rejection of misidentified QCD jets is needed.
In ATLAS, three algorithms are used for tau identification: rectangular cuts, a projective likelihood method and a boosted decision tree. They provide jet rejection factors between 10 and 1000 for signal efficiencies from 30% to 70%. This poster presents the performance of the different algorithms, and the systematic uncertainties on the tau identification efficiency are discussed.

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