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Calibration of the light jet mistag rate of the ATLAS b-tagging algorithm

A variety of algorithms have been developed to distinguish b-quark jets from jets containing only lighter quarks within the ATLAS experiment at the Large Hadron Collider (LHC). We describe the measurement of the false positive rate, i.e. the efficiency for the identification of jets arising from light quarks or gluons, for the algorithm most commonly used in ATLAS data analyses during the LHC Run II. The measurement is based on the full data sample collected at a centre-of-mass energy of 13 TeV by the ATLAS detector during the year 2015 and 2016 and it is performed in various ranges of jet transverse momentum and pseudorapidity. The final efficiencies are extracted using two complementary methods that give compatible results. The first method is based on a data sample enriched in light-flavour jets whereas the second one is based on the propagation of the uncertainties in the track reconstruction performance to the flavour tagging discriminant in the detector simulation. The results are compared to the efficiencies predicted by the nominal simulation, and are used to calibrate the efficiency of selecting light-flavour jets in simulation.

Experimental Collaboration

ATLAS Collaboration

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