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Optimisation of the ATLAS b-tagging algorithms for the 2017 LHC data-taking

The identification of b-quark initiated jets (b-tagging) is a fundamental tool for the physics of ATLAS. Such jets can be discriminated from those produced by the hadronization of light and charm quarks based on characteristic properties of B hadrons, such as the long lifetime and the hard fragmentation function. The algorithms are based either on the identification of tracks displaced from the primary vertex or the reconstruction of secondary vertices. The final discriminant is provided by combining the information from several algorithms with a boosted decision tree. In preparation for the 2017 data-taking campaign, several improvements have been made to the b-tagging in ATLAS. Two new taggers have been implemented, based on the presence of soft leptons inside jets, and on a Neural Network (NN) based on track parameters. In addition, a new training methodology designed to optimize the performance at high jet pT has been developed and successfully deployed. An overall improvement of the performance over the full jet pT spectrum has been achieved.

Experimental Collaboration

ATLAS Collaboration

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