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Quark and Gluon Tagging Calibration with the ATLAS

Saturday, 9 April 2022 16:00 (20 minutes)

The separation of quark and gluon initiated jets(q/g jets) is crucial to enhance the reach of many new physics searches at the ATLAS experiment in the Large Hadron Collider. A tagger serving as a tool to distinguish quark and gluon jets is developed based on the Boosted Decision Tree using charged-particle track observables associated with the jet. However, quark-versus-gluon jet tagging is difficult to be calibrated due to the difficulty of the hadronization modeling. To improve the performance of the tagger, a "matrix method" is applied to extract the q/g distributions to obtain a scale factor which is a ratio between data and Monte Carlo. The data taken from 2015 to 2018 with an integrated luminosity of 139.0 fb-1 are used to calibrate the tagger with two control samples to select dijet and gamma+jet events, providing various gluon and quark enriched samples. In this talk, the latest results of calibration and systematic uncertainties will be presented.

Career stage

Graduate student

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