

Performance and calibration of boosted $H(bb)$ tagging, including applications in physics analysis with ATLAS

Wednesday 4 August 2021 15:00 (15 minutes)

The physics programme at ATLAS involves a variety of Standard Model and Beyond Standard Model resonances decaying to two b-quarks, or to a pair of bosons, including the Higgs Boson. In order to identify these resonances at high momentum, ATLAS has developed a boosted $X\rightarrow bb$ tagger, a new NN-based tagging algorithm which combines the flavour information of up to three sub-jets associated to the large-R jet capturing the decays of these particles. This talk presents the Monte Carlo performance for the boosted $X\rightarrow bb$ tagger and the corresponding calibration strategy using the full Run-2 dataset gathered by ATLAS and comparing to simulation. Foreseen results include the signal tagging efficiencies derived using $Z(\rightarrow bb)+jets$ and $Z(\rightarrow bb)+\gamma$ events, and background mistag rates measured using $t\bar{t}$ and $g\rightarrow bb$ splitting in multi-jet events. This talk also presents measurements of Higgs boson properties using signatures for boosted jets containing two heavy-flavour hadrons and results of searches for high-mass resonances with at least one highly boosted Higgs boson in the final state, reconstructed via single large-radius jets and dedicated flavour tagging techniques.

Author: ATLAS COLLABORATION

Presenter: HE, Yajun (LPNHE, Paris)

Session Classification: Boosted Higgs + Heavy-Flavour