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Automation of the b-tagging calibration workflow in ATLAS

Particle cascades originating from quarks and gluons decays (jets) are omnipresent in proton-proton collisions at the LHC. The identification of jet flavours is essential for many physics searches at the ATLAS experiment. This is achieved using machine learning algorithms (taggers) which combine tracks and jets information to determine the flavour of the jets (b-jets, c-jets and light jets). These taggers are trained with simulated Monte Carlo events and, due to simulations imperfections, the taggers performance need to be measured in data in order to extract correction factors for the simulation predictions. ATLAS developed a set of calibration techniques for different jets flavours, and the correction factors need to be re-derived everytime a new tagger is deployed. Automating the calibration workflow significantly accelerates the calibration cycle and makes it less prone to manual mistakes. We present the first automated calibration framework in ATLAS using REANA platform. The results are compared with the official results using 139 fb^{-1} of 13 TeV collisions data from ATLAS, and a new set of calibration results with a customised setup is also included. The same technique can be applied in other contexts to reduce the amount of time and resources needed to achieve the scientific goals.

Collaboration / Activity

ATLAS

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