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Calibration of the light flavour mistag rate for ATLAS b-jet identification algorithms using the negative tag method in pp collisions at $\sqrt{s} = 13$ TeV

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Many analyses in ATLAS rely on the identification of jets containing b-hadrons (b-jets) with high efficiency while rejecting more than 99% of non-b-jets. Identification algorithms, called b-taggers, exploit b-hadron properties such as their long lifetime, their high mass, and high decay multiplicity. Recently developed ATLAS b-taggers using neural networks are expected to outperform previous b-taggers by a factor of two in terms of light jet rejection. Nevertheless, contributions from light jet mistags can be non-negligible in certain analyses phase spaces. It is therefore important to precisely measure the mistag rate of the light jets in both data and simulation to correct the corresponding rate in simulation.
Due to the high light jet rejection of the b-taggers, the mistag rate cannot be measured directly but rather by means of a modified tagger, designed to decrease the b-jet efficiency while leaving the light jet response unchanged. This so-called "negative tag method" has been improved recently: uncertainties are reduced by constraining non-light flavour contributions with a data-driven method and the dominant systematic uncertainty has been reduced significantly, from 10-60% to 5-20% due to improved inner detector modeling and an auxiliary analysis. The method and a selection of results released recently to the ATLAS collaboration using pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector will be presented.

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