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Transforming Flavor Tagging with the ATLAS Detector

The identification of jets containing b-hadrons is key to many physics analyses at the LHC, including measurements involving Higgs bosons or top quarks, and searches for physics beyond the Standard Model. We will present improvements to separate b-jets from jets stemming from lighter quarks with the ATLAS detector. The improved performance originates from state-of-the-art machine learning algorithms based on transformers, and is modeled well by ATLAS simulation. Compared with previous algorithms, the transformer-based approach rejects a factor of 2 more light- and c-quark-initiated jets. The expected performance of this algorithm at the High-Luminosity LHC (HL-LHC) will also be discussed in detail.

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