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New ATLAS b-tagging Algorithm for Run3

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The identification of jets containing b-hadrons (b-jets) is essential to many aspects of the ATLAS physics programme. Multivariate algorithms responsible for establishing the jet's flavour are developed by the ATLAS Collaboration, exploiting the distinct properties and correlations of charged particle tracks within the jet and reconstructed secondary vertices. The higher pileup conditions and the growing interest for searches in the high transverse momentum regime necessitate the development of improved algorithms using state-of-the-art machine learning techniques. Recent developments in track-based tagging introduced the Deep Impact Parameter Sets (DIPS) tagger, a neural network based on the Deep Sets architecture. It exploits the permutation invariance of track features in the network training and makes use of correlations among the tracks. Consequentially, an improved performance in the identification of b-jets compared to established approaches is observed. The performance of the novel DIPS tagger is evaluated using simulated data. This poster reviews the current state-of-the-art of jet flavour tagging algorithms used by the ATLAS Collaboration.

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