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Enhancing Prompt Lepton Identification: Development and Optimization of the PLIT Tagger

Within the ATLAS Experiment the Prompt Lepton Isolation Tagger (PLIT) served as an essential tool to distinguish between prompt muons originating from the decays of W and Z bosons and non-prompt muons generated in the semi-leptonic decays of b- and c-hadrons. Its central role was to effectively mitigate the presence of fake and non-prompt leptons in various multi-lepton final state analyses and had been extensively used in Run-2. The poster will present the ongoing efforts in developing and optimizing this tagger for Run-3 data analyses. Through the integration of new features and the exploration of novel machine learning algorithms, the tagger's discrimination power can be enhanced, allowing for more precise identification of prompt leptons originating from electroweak boson decays.

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