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Fast rejection of jets from pile-up in the ATLAS HLT using DIPZ

DIPZ is a machine learning algorithm aiming to re-purpose the Deep Impact Parameter Sets (DIPS) jet-flavour taggers to instead regress the jet's origin vertex position along the beam-line axis. Deployed at the ATLAS High Level Trigger (HLT), the DIPZ labels of each jet in an event are then used in an HLT jet algorithm to construct an event-wide likelihood-based discriminant variable (MLPL), which is used to select events compatible with targeted multi-jet signature selection. This is an HLT algorithm that takes superROI tracking information at the preselection step as inputs (prior to full-scan tracking) and performs fast rejection of jets from pile-up. The main goal for Run 3 is to reduce input to full scan tracking in an attempt to reduce the CPU consumption in the HLT while maintaining acceptable event rates and not compromising on signal efficiency for multi-jet signatures.

Secondary track

T16 - AI for HEP (special topic 2025)

Author: COLLABORATION, ATLAS

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