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Performance studies of the Run 3 jFEX algorithms in the ATLAS calorimeter trigger

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The Run 2 ATLAS trigger system is comprised of two levels: a hardware level (L1) and a software higher level trigger (HLT). Between late 2018 and early 2021, the ATLAS trigger system is undergoing upgrades. Two major sets of upgrades to the ATLAS level 1 trigger system will be the increase in read-out granularity in the LAr detectors ("supercells") and the addition of new Feature EXtractors (FEXs): Jet FEX (jFEX), global FEX (gFEX), and electromagnetic FEX (eFEX). The jFEX identifies jets and calculates missing transverse momentum and other energy sums. The gFEX identifies large radius jets. The new Run 3 L1 jets will make use of the improved resolution and the added algorithm flexibility provided by these upgrades. The incorporation of the jFEX and gFEX in Run 3 will cause L1 jet triggers to change significantly. To maintain the efficiency of the HLT and L1 jet chains and to maximize use of L1 rate, it is crucial that the performance of Run 3 L1 jet triggers is optimized. Jet triggers for low-threshold multijet triggers and for trigger-level analyses will benefit from polished Run 3 L1 jets. Studying the performance of Run 2 L1 jets allows for the determination of areas of improvement for Run 3 L1 jet triggers. Presented are trigger efficiencies for Run 2 L1 jets for various years, as well as the expected trigger performance for Run 3 L1 jets. Performance studies are also included for the jFEX MET algorithm.

I read the instructions

Secondary track (number)

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