

Triggering Jets in Run 3 with the ATLAS Global Feature Extractor

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The ATLAS Level-1 Calorimeter (L1Calo) trigger is a custom-built hardware system that identifies events containing calorimeter-based physics objects, including electrons, photons, taus, jets, and missing transverse energy. The L1Calo system has been upgraded for Run 3 to respond to the challenging environment characterized by increasingly high luminosity and pileup conditions. As part of this upgrade, a new FPGA-based component called the global feature extractor (gFEX) has been introduced in the L1Calo trigger system. Its purpose is to identify patterns of energy related to the hadronic decays of high momentum Higgs, W & Z bosons, top quarks, and exotic particles in real-time at the LHC crossing rate. Specifically, gFEX provides the ATLAS trigger system with the ability to detect events containing large-radius jets for the first time at Level-1. The design and capabilities of the gFEX system will be discussed, along with a review of its physics performance in Run 3.

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