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ATLAS Tau Trigger Algorithm for Global Trigger using Full Granularity Data

Saturday, 9 April 2022 15:20 (20 minutes)

The High-Luminosity Large Hadron Collider (HL-LHC) is expected to deliver 10 times the integrated luminosity as the previous three runs combined, with approximately 200 inelastic collisions per bunch crossing. This large increase in pileup imposes significant challenges on the ATLAS Trigger and Data Acquisition system hardware electronics. To meet this challenge, the Global Trigger is designed to accept full-granularity data from the calorimeter and muon systems at 40 MHz to perform offline-like trigger algorithms. Hadronically decaying tau leptons play a key role in Standard Model (SM) measurements and searches beyond the SM, but taus are challenging to trigger on due to their resemblance to QCD jets. A window-based tau trigger algorithm is being developed for the Global Trigger firmware using system Verilog. The presentation will focus on the progress on both software and the firmware aspects of this algorithm development as part of the ATLAS HL-LHC upgrade.

Career stage

Graduate student

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