



ID de la contribución : 83

Tipo : Talk

Muon shower tagging for high-pt and long live particle decay in the CMS drift chambers

In preparation for the High-Luminosity LHC, the CMS experiment is upgrading its Level-1 Trigger system to handle increased luminosity and pile-up. The new trigger system opens up a plethora of possibilities to detect non-conventional signatures such as those arising from long-lived particles (LLPs). In particular such LLPs may decay far away from the interaction point and decay to hadrons on the muon system. This contribution presents a dedicated muon-shower trigger architecture designed for the first layer of the barrel muon trigger of the CMS experiment at the LHC. Optimized for FPGA implementation with minimal resource utilization, the system ingest detector hits from the muon spectrometer, performs geometrical and timing-based clustering, and forms muon-shower candidates within the strict latency and bandwidth constraints of the first-level trigger. The logic can be also used to mitigate the efficiency degradation in the detection of high-momentum muons. Preliminary performance studies using Geant4-based simulations indicate a shower tagging efficiency in the order of 85%. The results indicate that muon-shower triggers can significantly improve discovery potential for new physics signatures with high hit multiplicity, as LLP decay after the calorimeters and Radiating high-pt muons

Primary author(s) : PRADO PICO, Javier (Universidad de Oviedo); ESTRADA ACEVEDO, Daniel (CERN)

Presenter(s) : PRADO PICO, Javier (Universidad de Oviedo)

Clasificación de la sesión : COMCHA

Clasificación de temáticas : COMCHA