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Triggering on muons, electrons, photons, tau leptons, jets and energy sums during the Run-3 of the LHC with the CMS Level-1 Trigger

The Compact Muon Solenoid (CMS) experiment implements a sophisticated two-level triggering system composed of the Level-1, instrumented by custom-design hardware boards, and a software High Level Trigger. A new Level-1 trigger architecture with improved performance is now being used to maintain high physics efficiency for the more challenging conditions experienced during Run III. The Large Hadron Collider (LHC) is operating with an unprecedented instantaneous luminosity (2.5e34) and pile-up (65). We present the performance of the electron, photon, tau lepton, jets and energy sums with the recent proton collision data collected. The calorimeter trigger system plays a central role in achieving the ambitious physics program of Run III. The trigger benefits from an enhanced granularity of the calorimeters to optimally reconstruct the trigger objects. The selection techniques used to trigger efficiently on benchmark analyses will be presented, along with the strategies employed to guarantee efficient triggering for new resonances and other new physics signals involving electron/photon final states. New algorithm firmware was developed to target unconventional signatures from new physics.

Collaboration / Activity

CMS Collaboration

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