



Contribution ID: 139

Type: Poster

Performance of electron, photon and muon triggers at the CMS High Level Trigger

Summary

The trigger systems of the LHC detectors play a crucial role in determining the physics capabilities of the experiments. A reduction of several orders of magnitude of the event rate is needed to reach values compatible with the detector readout, offline storage and analysis capabilities. The CMS experiment has been designed with a two-level trigger system: the Level 1 (L1) Trigger, implemented on custom-designed electronics, and the High Level Trigger (HLT), a streamlined version of the CMS reconstruction and analysis software running on a computer farm.

Here we will present the design and performance of the main muon, electron and photon triggers, in view of the more challenging conditions for the LHC Run 2. For the muon case, we will discuss the improvement of local drift tube and cathode strip chamber reconstruction, standalone muon tracking and silicon tracking+standalone combined muon reconstruction. For the electron/photon case, we will discuss the deployment of new local electromagnetic calorimeter reconstruction and improvements on the object identification and isolation.

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Track Classification: Poster presentations