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Level 1 Muon Triggers for the CMS Experiment at the HL-LHC

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The High Luminosity upgrade of the CERN Large Hadron Collider will deliver proton-proton collisions at 14 TeV with instantaneous luminosities up to 7.5*10^34 cm^-2 s^-1. The physics program of the Compact Muon Solenoid (CMS) Experiment strongly depends on the ability to identify muons at an early trigger stage, over a momentum range spanning from few GeV to the TeV scale. Several upgrades of the muon triggers are foreseen in order to retain such capabilities in view of the the High Luminosity LHC, including the acceptance on electroweak processes and the sensitivity to physics beyon the Standard Model. With this contribution, we review the current status of the design of highly efficient muon trigger, its architecture, based on state-of-the-art FPGAs and O(10) Gbps serial optical links, and the foreseen muon identification algorithms. We will discuss the local trigger primitives generation, depending on the new read-out of several detectors, their increased acceptance, and online muon reconstruction algorithms, both standalone and with the contribution of the silicon tracker at Level 1. The expected benefits for the HLLHC physics program are presented as well.

Author: MEYER, Arnd (Rheinisch Westfaelische Tech. Hoch. (DE))

Presenter: FOLGUERAS, Santiago (Universidad de Oviedo (ES))

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