Contribution ID: **699**   Type: **Poster**

The CMS Level-1 Endcap Muon Trigger at the High-Luminosity LHC

Wednesday 29 July 2020 13:33 (3 minutes)

In the CMS endcap region, muon reconstruction in the Level-1 (L1) trigger is not straightforward because of the non-uniform magnetic field, high pile-up and punch-through interactions. However, the new muon detectors and the upgraded trigger processing capabilities proposed for the Phase-2 upgrade will allow the implementation of novel techniques that successfully address these challenges. For instance, track-finding and reconstruction of the standalone and displaced muons are carried out by a neural network-based algorithm. In addition, a proposed Global Muon Trigger system will have access to tracker tracks, muon trigger tracks and standalone muon detector hits. These objects can then be combined to improve the muon momentum resolution, reduce the muon trigger rates, and form multi-object triggers such as lepton-flavour violating tau->3mu decays. We present here preliminary studies addressing all these new capabilities.

Secondary track (number)

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Session Classification: Detectors for Future Facilities (incl. HL-LHC), R&D, Novel Techniques - Posters

Track Classification: 13. Detectors for Future Facilities (incl. HL-LHC), R&D, Novel Techniques