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Upgrade of the ATLAS Level-0 Endcap Muon Trigger for HL-LHC

Thursday, May 27, 2021 5:12 AM (18 minutes)

Status of the development of the Level-0 endcap muon trigger system for the ATLAS experiment at the HL-LHC is presented. The upgraded system reconstructs muon candidates with an improved pT resolution by combining data from various sub-detectors. This is realized by exploiting evolution of data transmission technologies, to send all hit data from Thin Gap Chambers (TGCs) and other sub-detectors to the counting room.
Performance of this new trigger system is also shown. Trigger efficiency is estimated with a software based algorithm and using simulation, to be higher than 90% for the threshold of pT>20 GeV in the endcap region. Trigger rate is also estimated with a software algorithm and using pp collision data, overlaid to simulate the high pileup condition at the HL-LHC. to be lower than 25 kHz for the threshold of pT>20 GeV.
Implementations of the new trigger algorithms with firmware for an FPGA, along with development of a new trigger prototype board are also shown.

TIPP2020 abstract resubmission?

Yes, this would have been presented at TIPP2020.

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