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ATLAS Level-1 Endcap Muon Trigger for Run-3

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The LHC is expected to increase its centre-of-mass energy to 14 TeV and to keep longer time with an instantaneous luminosity of about 2.0x10ˆ34 cmˆ-2sˆ-1 for Run-3 scheduled from 2021 to 2024. In order to cope with the high event rate, upgrades of the ATLAS trigger system are required. The level-1 endcap muon trigger system identifies muons with high transverse momentum by combining data from a fast muon trigger detector, Thin-Gap Chamber. In the ongoing upgrade in this year, new detectors called the New-Small-Wheel (NSW) and RPC-BIS78, will be installed in the inner station region for the endcap muon trigger. Finer track information from the NSW and RPC-BIS78 can be used as part of the muon trigger logic to enhance performance significantly. In order to handle data from both TGC and NSW, some new electronics have been developed, including the trigger processor board known as Sector Logic (SL). The SL board has a modern FPGA to make use of Multi-Gigabit transceiver technology, which will be used to receive data from the NSW. The readout system for trigger data has also been re-designed, with the data transfer implemented with TCP/IP instead of a dedicated ASIC. This makes it possible to minimise the use of custom readout electronics and instead use some commercial computers and network switches to collect, format and send the data. This presentation describes the aforementioned upgrades of the level-1 endcap muon trigger system. Particular emphasis will be placed on the new algorithm in Sector Logic and the current status of installation and commissioning. The expected trigger performance by the new algorithm will also be discussed.

I read the instructions

Secondary track (number)

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