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The GEM GE1/1 station of the CMS muon detector: status, commissioning and operation in magnetic field

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During Run 3, the LHC will deliver instantaneous luminosity in the range $5 \times 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$ to $7 \times 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$. To cope with the high background rates and to improve the trigger capabilities in the forward region, the muon system of the CMS experiment has been upgraded with two new stations of detectors (GE1/1), one in each endcap, based on triple-GEM technology. The system was installed in 2020 and consists of 72 ten-degree Super Chambers, each made up of two layers of triple-GEM detectors. GE1/1 provides two additional muon hit measurements which will improve muon tracking and triggering performance. We report on the status of the ongoing commissioning phase of the detector and present preliminary results obtained from cosmic-ray events. We discuss detector and readout electronics operation, stability and performance, and preparation for Run 3. Particular attention will be given to issues encountered during CMS magnet commissioning which induced trips and short-circuits in the GEM detectors.

In-person participation

Yes

Primary author: MITTAL, Monika (Beihang University (CN))**Presenter:** MITTAL, Monika (Beihang University (CN))**Session Classification:** Operation, Performance and Upgrade (Incl. HL-LHC) of Present Detectors**Track Classification:** Operation, Performance and Upgrade (Incl. HL-LHC) of Present Detectors