

Commissioning and prospects of first GEM station at the CMS experiment

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The CMS Collaboration has been developing a Gas Electron Multiplier (GEM) detector in the endcap regions of the CMS muon system to maintain the high level of performance achieved during Run 2 in the challenging environment of the High Luminosity phase of the LHC (HL-LHC). The GEM chambers at endcap station 1 (GE1/1) have been installed in the second long shutdown. The technical and operational challenges of large-area GEM chambers have been identified during the commissioning of five GEM supper chambers (“slice test”) in Run 2. This lead to a modification in its system design. A test with cosmic-ray muons is the final stage of quality control before the full-scale installation in the CMS detector. We review the performance of muon detection in the slice test, an improvement of the readout system, commissioning status, and prospects for the muon trigger for Run 3.

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