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## Design optimization and initial performance of the GEM GE2/1 detector for the upgrade of the CMS endcap muon system

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After Run 3, the Large Hadron Collider (LHC) will be upgraded to its High Luminosity phase (HL-LHC). The triggering capabilities in the forward region of the CMS detector will be enhanced to accommodate the dramatic increase in collision rate. New stations of triple-layer Gas Electron Multiplier (GEM) detectors will be installed in the endcap regions of the CMS muon system. The first set of two GEM stations (GE1/1) are installed. A second set of two stations (GE2/1) will consist of 72 20-degree chambers, 36 in each endcap. These chambers will improve trigger performance by measurement of the muon bending angle. In this talk we discuss the design modification between GE1/1 and GE2/1, the performance of a GE2/1 prototype installed in the CMS detector, and progress towards installation of the full GE2/1 system.

### In-person participation

Yes

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