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Upgrade of the CMS Muon Spectrometer in the forward region with the GEM technology

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The Large Hadron Collider (LHC) will be upgraded in several phases that will allow to significantly expanding its physics program. After the expected long shutdown in 2018 (LS2) the accelerator luminosity will be increased to 2 – 3 × 1034 cmˆ−2sˆ−1 exceeding the design value of 1 × 1034 cmˆ−2sˆ−1 allowing the CMS experiment to collect approximately 100 fbˆ−1/year. A subsequent upgrade in 2022-23 will increase the luminosity up to 5 × 1034 cmˆ−2sˆ−1.
The CMS muon system must be able to sustain a physics program after the LS2 shutdown that maintains sensitivity for electroweak scale physics and for TeV scale searches similar to what was achieved up to now. To cope with the corresponding increase in background rates and trigger requirements the installation of additional sets of muon detectors, referred to as GE1/1, GE2/1 and ME0 that use Gas Electron Multiplier (GEM) technology has been planned.
While the installation of the GE1/1 chambers has been already approved and scheduled by 2019/20, the GE2/1 and ME0 project are now in the final phase of review.
We present an overview of the Muon Spectrometer upgrade using the GEM technology, the details of the ongoing GE1/1 chambers production with the first results of the Quality Assurance tests performed on a such a chambers as well as the design and the technical solution adopted for the foreseen GE2/1 and ME0 chambers.

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