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## **ME0 second generation prototype chamber characterization for CMS phase II upgrade in the Muon forward region**

*Tuesday 17 May 2022 19:00 (1 hour)*

The CMS experiment is a general-purpose detector installed in Large Hadron collider. During the High Luminosity LHC (HL-LHC) phase, it expects 10 times higher luminosity than actual LHC operation regime. Forward region of Muon system of CMS will be equipped with 3 additional triple GEM based muon stations. ME0 is the innermost layer of this three stations which will be installed right behind the new endcap calorimeter; it will be exposed to a background particle fluxes up to 150 kHz/cm<sup>2</sup>. Recent R&D for rate capability and gain drop study brought the changing of the original GEM foils High Voltage segmentation direction. Second-generation prototype is segmented in radial direction different from the previous horizontal segmentation of GE11 and GE2/1. This study will present mainly the results of characterization of new ME0 prototype module which include the mechanical design of second-generation prototype, segmentation simulation study results, assembling process, gas tightness, HV stability test, energy spectrum, effective gain result and its response uniformity results. This module fully characterized, as above, will be installed in GIF++ facility for high background irradiation tests and beam test studies; its initial experimental setup is also presented.

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