Contribution ID: **448** Type: **Poster**

High rate capability studies of triple-GEM detectors for the ME0 upgrade of the CMS Muon spectrometer

Tuesday, May 25, 2021 5:12 AM (18 minutes)

In the CMS Muon System gaseous detectors, the increase in luminosity will produce a particle background ten times higher than at the LHC. To cope with the high rate environment and maintain the actual performance, the triple-Gas Electron Multiplier technology is a promising candidate as high-rate capable detectors for the CMS-ME0 project. An intense R&D and prototype phase is currently ongoing to prove that technology meets the stringent performance requirements of highly efficient-particle detection in the harsh background environment expected in the ME0 region. The authors will describe the recent rate capability studies on triple-GEM detectors by using a high intensity X-ray generator. We will present the novel foils design based on double-sided segmented GEM-foils, high voltage distribution powering and filtering, which the collaboration adopted for realization of the latter projects, and their impact on the performance of the detector in the light of new rate capability studies.

TIPP2020 abstract resubmission?

Funding information

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Session Classification: Sensor Posters: Gaseous Detectors

Track Classification: Sensors: Sensors: Gaseous Detectors