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Rate capabilities and longevity of CMS Cathode Strip Chambers

The forward muon system of the CMS experiment is comprised of about 500 Cathode Strip Chambers (CSCs) with the total sensitive area of 6000 square meters. In view of the operating conditions at High Luminosity LHC (HL-LHC), it is vital to assess the CSC system performance in terms of their ability to operate in the expected HL-LHC instantaneous rates and in terms of their longevity over the HL-LHC lifespan. We present the first results obtained with two full-scale chambers at the new CERN GIF++ (Gamma Irradiation Facility), which allows us to address these two questions. In addition, we report the results of the gas gain monitoring in the entire CMS CSC system over the duration of the LHC Run 1 period.

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