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Upgrade of the CSC Muon System for the CMS Detector at the HL-LHC

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The Large Hadron Collider (LHC) will be upgraded in several phases to significantly expand its physics program. After the current long shutdown from 2018-2020 (LS2) the accelerator luminosity will be increased to 2 – 3 * 10ˆ34cm−2s−1 exceeding the design value of 1 * 10ˆ34cm−2s−1 allowing the CMS experiment to collect approximately 100 fb−1/year. A subsequent upgrade in 2022-23 will increase the luminosity up to 5 * 10ˆ34cm−2s−1. The CMS muon system must be able to sustain a physics program after the LS2 shutdown that maintains sensitivity to electroweak scale physics and for TeV scale searches similar to what was achieved up to now For the Cathode Strip Chamber (CSC) muon detectors, the electronics will be upgraded to handle the expected higher rates. The design of the upgraded CSC electronics will be discussed as well as the status of the first phase of the electronics installation. In view of the operating conditions at HL-LHC, it is vital to asses the detector performance for high luminosity. Accelerated aging tests are being performed to study the behavior of the CSC detectors under conditions which are nearly an order of magnitude beyond the original design values. The status of this irradiation campaign and results will be presented.

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