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Aging study on Resistive Plate Chambers of the CMS muon detector for HL-LHC

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In the next years, during the High Luminosity LHC (HL-LHC) program, the instantaneous luminosity will increase up to $5 \times 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$ which means factor five more than the nominal LHC luminosity. During this period the present CMS Resistive Plate Chambers (RPC) system will be subjected to high background rates and operating conditions much harder with respect those for which the detectors have been designed. Those conditions could affect the detector properties and induce aging effects. To study if the present RPC detectors can survive the hard background conditions during the HL-LHC running period, a dedicated longevity test is set up at the CERN Gamma Irradiation Facility (GIF++), where few spare RPCs are exposed to a high gamma radiation for a long term period to mimic the HL-LHC operational conditions. During the longevity test the main detector parameters are monitored as a function of the integrated charge. Preliminary results of the study after having collected a sufficient amount of the expected integrated charge will be presented.

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