

Longevity Study on the CMS Resistive Plate Chambers for HL-LHC

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The CMS Resistive Plate Chambers (RPC) system has been certified for 10 years of LHC operation. In the next years, during the High luminosity LHC (HL-LHC) phase, the LHC instantaneous luminosity will increase to factor five more than the nominal LHC luminosity. This will subject the present CMS RPC system to high background rates and operating conditions much higher with respect those for which the detectors have been designed. Those conditions could affect the detector properties and introduce a non-recoverable aging effects. A dedicated longevity test is set up in the CERN Gamma Irradiation Facility (GIF++) to study if the present RPC detectors can survive the hard background conditions during the HL-LHC running period.

During the irradiation test, the RPC detectors are exposed to a high gamma radiation for a long period and the detector main parameters are monitored as a function of the integrated charge. The results of the irradiation test after having collected a sufficient amount of the expected integrated charge will be presented.

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