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## Simulation studies of the impact of the CMS radiation environment on RPC detectors

The High-Luminosity Large Hadron Collider (HL-LHC) upgrade aims to increase its luminosity by a factor of 5 beyond the

LHC's design value and the integrated luminosity by a factor of 10, increasing the potential for discoveries after 2025.

The increased collision rate of particles will be a challenge for the CMS systems as higher levels of radiation could

degrade them and affect their performance. It is therefore important to understand the expected radiation environment

and its impact on the different sub-detectors. In this study we use the FLUKA simulation to reproduce the radiation

environment during CMS Run-2 and the GEANT4 simulation to estimate its impact on the RPC detectors.

Results are

compared with measurements collected by the RPC system during 2018 and reasonable agreement is observed.

This

study serves as a benchmark for future simulations with a Phase-2 (HL-LHC) configuration.

**Primary author:** URIBE ESTRADA, Cecilia (Autonomous University of Puebla (MX))

**Presenter:** URIBE ESTRADA, Cecilia (Autonomous University of Puebla (MX))

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