

# Simulation for LHC radiation background: optimisation of monitoring detectors and experimental validation

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Monitoring radiation background is a crucial task for the operation of LHC experiments. A project is in progress at CERN for the optimisation of the radiation monitors for LHC experiments. A general, flexibly configurable simulation system based on Geant4, designed to assist the engineering optimisation of LHC radiation monitor detectors, is presented. Various detector packaging configurations are studied through their Geant4-based simulation, and their behaviour is compared. A quantitative validation of Geant4 electromagnetic and hadronic models relevant to LHC radiation background monitoring is presented; the results are based on rigorous statistical methods applied to the comparison of Geant4 simulation results and experimental data from dedicated test-beams.

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