

Radiation damage effects to the CMS Silicon Tracker

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Studies of radiation damage to the sensors of the CMS Pixel and Strip Detectors during LHC running in 2011 and 2012 are presented. Leakage current and depletion voltage are monitored with increasing fluence. Methods for addressing the challenges of these measurements in the context of ongoing detector operations are discussed. These include the derivation of depletion voltage from hit efficiencies, the measurement of silicon temperature and extrapolation of current as a function thereof, and determination of the total fluence from LHC luminosity. The results allow for validation of existing radiation damage models of radiation damage and an improved understanding of the anticipated lifetime of the detectors.

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