

measurements of radiation damage in the CMS Pixel detector with the first few invers femptobarns

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Studies of radiation damage to the CMS Pixel Detector during LHC running 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 Pixel Detector.

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