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Radiation Experience with the CMS Pixel Detector

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The CMS pixel detector is the innermost component of the CMS tracker occupying the region around the center of CMS, where the LHC beams are crossed, between 4.3 cm and 30 cm in radius and 46.5 cm along the beam axis. They are operated in a high-occupancy and high-radiation environment created by particle collisions in the LHC. Studies of radiation damage effects to the sensors were performed throughout the first running period of the LHC. Leakage current, depletion voltage, pixel read-out thresholds, and hit finding efficiencies were monitored as functions of the increasing particle fluence. The methods and results of these measurements will be described in the presentation together with their implications to detector operation as well as to performance parameters in offline hit reconstruction.

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