Radiation damage to currently running LHC silicon detectors

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During the summer of 2012 the integrated luminosity delivered to ATLAS and CMS has surpassed the threshold required to induce type-inversion of the silicon sensors in the innermost tracking layers. The LHCb VELO is subject to even higher fluence of ~$6x10^{13}$ 1 MeV neq cm^{-2} per fb^{-1} at the inner tips of the sensors, only 8.2 mm from the beam. The varied experimental geometries and fluence rates present the opportunity to study the evolution of silicon parameters with realistic rates and operating temperatures. The effects of radiation on the sensors are routinely monitored by each experiment and the measurements have been quantitatively compared and discussed via the Inter-Experiment Working Group on Radiation Damage to Silicon Detectors. The leakage current measurements are compared with predictions based on the Hamburg Model and FLUKA LHC radiation background simulations. The methods established to monitor the evolution of leakage current and effective depletion voltage are discussed. A novel method developed for continued monitoring after type-inversion is outlined and initial results are presented. The models are used to extrapolate to the future LHC phase I upgrade, including cooling scenarios during the LHC long shutdowns.