

Temperature dependence of reverse current of irradiated Si detectors

Wednesday 30 May 2012 10:25 (20 minutes)

Temperature dependences of reverse current, $I(T)$, of irradiated Si detectors are simulated and analyzed in the scope of carrier generation rate based on Shockley-Read-Hall statistics. Two models of bulk generation current have been developed for simulation of $I(T)$ dependences: carrier generation via a single effective level in the bandgap, and carrier generation via midgap levels of radiation induced defects considered in PTI model of irradiated Si detectors –deep donors $E_v + 0.48$ eV and deep acceptors $E_c - 0.53$ eV. The results have shown that: a) both models give good fits of the experimental data; b) the activation energy E_a of the $I(T)$ dependence for detectors irradiated by 23 GeV protons and 1 MeV neutrons is the same and equals 0.65 eV.

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Session Classification: Material and Defect Characterization

Track Classification: Detector Characterization