



Contribution ID: 27

Type: not specified

Electric field, mobility and trapping in Si detectors irradiated with neutrons and protons up to $1e17$ n_{eq}/cm^2

Wednesday, 8 June 2016 11:40 (20 minutes)

Electric field in silicon irradiated with neutrons up to $1e17$ n_{eq}/cm^2 and PS protons up to $3e16$ p/cm^2 was investigated by edge-TCT. From the $v(E)$ dependence under FW bias mobility degradation with fluence was extracted. From a comparison of concurrently measured FW and reverse velocity profiles absolute electric field profiles in the silicon bulk were obtained. A $1/\sqrt{\Phi}$ dependence of mobility on fluence was observed for both irradiations with protons provoking $\sim 20\%$ more degradation at equal NIEL. The observed mobility degradation and the values of electric field indicate substantial reduction of trapping from linear extrapolation of low fluence values. An attempt is made to extract information on trapping from the measured waveforms.

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Session Classification: Radiation Damage II