

Electric field and mobility in extremely irradiated silicon

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Electric field in silicon irradiated with neutrons up to $1e17$ n_eq/cm² was investigated by edge-TCT. Methods for absolute determination of electric field were developed. From the $v(E)$ dependence mobility degradation with fluence was extracted. A simple field structure was observed, consistent with a SCR and “ENB”, a region that does not contribute to leakage current and the electric field is consistent with current transport across highly resistive silicon. The observed mobility change and the values of electric field indicate substantial reduction of trapping from linear extrapolation of low fluence values.

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