

Drift Mobility and Electric Field in Silicon Detectors Irradiated with Neutrons and Protons up to $1E17$ n_{eq}/cm^2

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Electric field in silicon irradiated with neutrons up to $1e17$ n_{eq}/cm^2 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 there 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.

An irradiation campaign at CERN IRRAD covering the fluence range from $3e14$ n_{eq}/cm^2 to $3e16$ n_{eq}/cm^2 shall provide complementary information on electric field and mobility changes after charged hadron irradiation.

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