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Electrical Properties of Fe-Implanted Silicon Based Schottky Diodes for Detectors in High Energy Physics Experiment.

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The current-voltage (I-V) measurements were carried out on un-implanted and Iron (Fe) implanted n-type Silicon to establish and study a change in electrical properties of the diode with Fe doping concentration. The n-type silicon (n-Si) material was doped with Fe at fluences of 10ˆ15,10ˆ16 and 10ˆ17 ion/cmˆ2 and schottky diodes were fabricated. The (I-V) data were used to determine the effect of Fe in the n-Si diode. The results obtained exhibited a non-ohmic behavior for un-implanted n-Si and an ohmic behavior for the Fe-n-Si. This also confirmed that the defects have created deep levels within the energy gap of Si which acts as recombination or generation centres. The introduction of Iron at difference fluences has changed the material from a lifetime material to a relaxation material which will make the diodes efficient for detectors in radiation harsh environments.

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