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Defect investigations of electron irradiated p-type Si sensors

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P-type silicon exposed to high radiation environment undergoes an apparent deactivation of the boron dopant –known as the so-called Acceptor Removal Effect (ARE). To investigate the impact of high energy electrons of different fluences on the ARE, p-type Si diodes, irradiated at the CLEAR facility at CERN with 200 MeV electrons as well as sensors irradiated with 5.5 MeV electrons at Belarusian State University in Minsk were characterized.

In this talk radiation induced changes in the macroscopic device properties extracted from C(V) and I(V) measurements will be presented. Furthermore, an overview of the microscopic radiation induced defects, investigated by TSC (Thermally Stimulated Current technique) as well as DLTS (Deep Level Transient Spectroscopy) measurements will be given. Both techniques provide information about defect characteristics such as activation energy, capture cross section or defect concentrations, and enable to calculate the defect generation rates for the electron irradiated sensors.

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