



Institut  
Ruđer  
Bošković



Contribution ID: 35

Type: **not specified**

## Charge collection characterization of irradiated diode using a novel edge-on electron beam technique

Thursday, 19 November 2020 09:20 (20 minutes)

The charge collection of two  $n^+p^+p^+$  pad diodes has been measured using a 5 GeV electron beam (at DESY) entering from the 150  $\mu\text{m}$  thick side edge side of diodes. Using the EUDAQ telescope it is possible to precisely reconstruct the beam position. The collected charge as a function of the beam position along the diode thickness is investigated.

This measurement technology is novel and comparable to the better-known edge-TCT. The alignment of the beam direction with respect to the diode surface was done online during the data taking.

The diodes have an area of 25  $\text{mm}^2$  and a p-doping concentration of  $4 \times 10^{12} \text{ cm}^{-3}$ . The measurements were performed at  $-20 \text{ }^\circ\text{C}$  for bias voltages up to  $V_{\text{bias}} = 800 \text{ V}$ . One diode was irradiated with 23 MeV protons to a 1 MeV neutron equivalent fluence of  $\Phi_{\text{eq}} = 2 \times 10^{15} \text{ cm}^{-2}$ . The second diode was not irradiated. For the non-irradiated diode, the charge profile is uniform as a function of the beam position. For the irradiated diode, the charge profile is non-uniform and the changes as the applied bias voltage.

This work presents the procedure of measurement and the online alignment along with the results obtained for two diodes.

**Primary authors:** HAJHEIDARI, Mohammadtaghi (Hamburg University (DE)); SCHWANDT, Joern (Hamburg University (DE)); Prof. GARUTTI, Erika (university of hamburg); EBRAHIMI, Aliakbar (DESY)

**Presenter:** HAJHEIDARI, Mohammadtaghi (Hamburg University (DE))

**Session Classification:** Transient Current Techniques (Thursday)