



Contribution ID: 69

Type: not specified

## Two Photon Absorption –Transient Current Technique: TCAD Simulation of a PIN & Influence of Radiation Damage on the TPA-TCT

*Wednesday, 29 November 2023 14:20 (20 minutes)*

The Two Photon Absorption –Transient Current Technique (TPA-TCT) is a tool for the characterisation of particle detectors. Contrary to present state of the art TCT, TPA-TCT enables characterisation measurements with three dimensional spatial resolution. A tabletop setup for the investigation of silicon based detectors was commissioned at CERN to pioneer the technique. A 430 fs pulse fiber laser with a wavelength of 1550 nm is used, to generate excess charge by Two Photon Absorption in silicon. The laser light is focused so that excess charge is generated in a small volume (approximately  $1\mu\text{m} \times 1\mu\text{m} \times 20\mu\text{m}$ ) around the focal point. This talk presents the TPA-TCT setup at CERN SSD and shows recent investigation of radiation damage in 150  $\mu\text{m}$  thick planar sensors fabricated by CIS. The beam depletion due to linear absorption and the influence on the refractive index are investigated. Furthermore, TCAD simulation are used to study TPA-TCT measurements in a PIN diode.

**Primary author:** PAPE, Sebastian (Technische Universitaet Dortmund (DE))

**Co-authors:** WIEHE, Moritz (CERN); MOLL, Michael (CERN); FERNANDEZ GARCIA, Marcos (Universidad de Cantabria and CSIC (ES))

**Presenter:** PAPE, Sebastian (Technische Universitaet Dortmund (DE))

**Session Classification:** Radiation damage general