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Two Photon Absorption –Transient Current Technique: Techniques for the investigation of segmented sensors and the influence of temperature

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The Two Photon Absorption –Transient Current Technique (TPA-TCT) setup at CERN uses a 430 fs pulse fiber lasers, with a wavelength of 1550 nm, which is in the quadratic absorption regime of silicon. Highly focusing optics are used to only generate excess charge carriers in a small volume (approximately $1\mu\text{m} \times 1\mu\text{m} \times 20\mu\text{m}$) around the focal point of the laser beam, which enables a resolution in all three spatial directions. This three dimensional resolution is particular useful for the investigation of segmented detectors. The TPA-TCT was used to investigate a passive strip CMOS detector. This talk presents the results of this study and introduces the weighted prompt current method and the mirror techniques that were especially developed for the analysis of segmented devices. Furthermore, a study about the influence of temperature on the measurements of the TPA-TCT is presented.

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