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Two Photon Absorption –Transient Current Technique: Recent results on segmented sensors and improved measurement methods

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The Two Photon Absorption –Transient Current Technique (TPA-TCT) exploits the quadratic absorption mechanism of light, to only excite charge carriers in a small volume around the focal point. Compared to conventional TCT methods that use light in the linear absorption regime, TPA-TCT enables true 3-dimensional resolution, while providing all the benefits of conventional TCT.

The TPA-TCT setup at CERN uses a 430 fs pulsed fiber laser, with a wavelength of 1550 nm and highly focusing optics, to only generate excess charge carriers in a volume of $1\mu\text{m} \times 1\mu\text{m} \times 20\mu\text{m}$ around the focal point. This talk presents the investigation of planar sensor, a HV-CMOS detector and a strip detector and highlights the power of the method. Furthermore, the weighted prompt current method and the mirror techniques are introduced that were especially developed for the investigation of segmented devices.

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