

TPA-TCT: A novel Transient Current Technique based on the Two Photon Absorption (TPA) process

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Transient Current Techniques (TCT) based on laser-induced currents produced by Single Photon Absorption (SPA) processes in the sensor substrate have been used extensively to study the electric field distribution of irradiated silicon sensors. A new laser-based Transient Current Technique is introduced here for the first time where the free charge carriers are created in a Two Photon Absorption (TPA) process induced by a focused femto-second laser pulse with a wavelength of 1300nm. The fact that in a TPA process the absorption of the light depends on the square of the intensity of the light beam used for the current generation allows to create very localized TPA-induced electron-hole pairs and opens the possibility to carry out a 3D mapping of the sensor's electric field with micrometric resolution. A first proof-of-concept measurement is presented in this talk.

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