

Plasma Effects in TCT-TPA

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TCT-TPA (Transient Current Technique-Two Photon Absorption) is a new pulsed infrared laser method for mapping the electric field in solid state particle detectors, combining high spatial resolution with the use of Ramo theorem. As it uses focused ultrashort infrared lasers, plasma effects need to be contended with. They are responsible of the increase of detector current pulse duration. From a mathematical model originated in the analysis of plasma effects during ion detection with semiconductor detectors, we determine the charge collection time increase and the verification with a TCT-TPA experiment. The agreement is good enough to predict the maximum admissible femtosecond laser pulse energy to avoid plasma effects.

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