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Gain suppression mechanism in LGADs and SEE studies in a RD53B chip measured with the TPA-TCT method

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The Two Photon Absorption –Transient Current Technique (TPA-TCT) uses fs-pulsed infrared lasers, with photon energies below the silicon band gap. Excess charge carriers are generated mainly 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, enabling resolution in all three spatial directions. Following the initial success of the method, a compact TPA-TCT setup was developed at CERN. The current setup status, first measurements on LGAD sensors with focus on the gain suppression mechanism, measurements on non-irradiated PIN diodes, and Single Event Effect (SEE) studies in a RD53B chip will be presented.

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