

2nd TCT Workshop

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Jožef Stefan Institute

Book of Abstracts

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Advanced TCT systems

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Beam locator/Beam monitoring/Support PCBs

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Simulations / 20

Comparison of different signal simulation tools

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Results from recent TCT measurements on different detector structures / 17

Comparison of different simulations tools and update on KDet-Sim

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Diode measurements and pulse analysis with TCT

- 1.) Analysis of the signal - reflection
- 2.) Mobility measurements

Results from recent TCT measurements on different detector structures / 9

Edge TCT on AMS H35 HV-CMOS devices

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Edge-TCT measurements

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Edge-TCT measurements on different HVCMOS devices

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Laboratory results on LGADs (Timing)

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Mobility measurements

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Resolving authentic time dependence of time-of-flight photocurrent in organic semiconductors

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Time-of-flight photoconductivity (TOF) is a powerful method, which is used to study conversion of photons to electrons and their transport through thin organic semiconductor layers. Compared to current-voltage characterization methods, TOF results are unaffected by the spurious effects at the semiconductor/metal interfaces. Precise knowledge of photocurrent time-dependence is of crucial importance for the determination of charge transport parameters such as mobility and the width of charge transporting states. Our TOF measurements of single-crystals of dioctyl-benzothienobenzothiophene (C8-BTBT) show that transport of photexcited carriers and the corresponding photocurrent across two coplanar metal contacts separated by 120 μm , occurs in a fraction of a microsecond. However, measured time-dependent photocurrent ($I(t)$), compared to theoretical predictions, showed additional peaks and significant broadening of the $I(t)$ lineshape. We found that additional peaks correspond to signal reflections from the waveguide terminations. And peaks broadening occurs due to 3-ns duration of the photoexcitation laser. Direct deconvolution of the measured signal was not possible due to signal reflections and relatively high noise-to-signal ratio. Therefore we estimated a time dependence of the photocurrent, which reproduced the measured signal transient. Estimated $I(t)$ was considered as an authentic TOF response of the material under investigation.

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Scanning TCT - example of operation

- 1.) Beam condition monitoring at work (fibre split and in-beam version)
- 2.) Cabling issues and related problems
- 3.) Tuning the right signal
- 4.) Beam locator

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Single event effect tests with focused light

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Results from recent TCT measurements on different detector structures / 18

TCAD simulations

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TCAD simulations

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TCT in presence of continuous illumination - studies of bulk material

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TCT measurements on 3D detectors

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TCT measurements on diodes

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TCT pulse analysis and corrections

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Temperature dependance of LGAD response

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Two photon absorption Transient Current Technique System

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Understanding pulse shapes at high fluences

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Update on KDetSim

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Update on TRACS

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Update on TRACS simulation

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Welcome