

NEXT LITE-SEMINAR

Rectifying Field Effect Transistors: Detectors for Terahertz and Beyond

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Date and Time: **Monday, November 13th 2017, 14:00**

Location: **TU Wien, Photonics Institute**
Gußhausstraße 27-29, 1040 Vienna, Seminar room CBEG02,
ground floor.

Host: K. Unterrainer

Abstract

While field effect transistors are used as amplifiers below their respective cut-off frequency, they offer a rectification effect if operated (far) above f_T and f_{max} . We have recently shown that the rectification effect persists far into and even above the THz range (100 GHz-10 THz) where no transistor can be used as amplifier any more. The presentation will discuss the basic detection principle and show results on both antenna-coupled field effect transistors, optimized for the lower part of the THz range, and large area detectors (LA-FET) that are designed for operation at high power Terahertz facilities. The LA-FETs further are able to detect NIR laser pulses. They are optimized in terms of speed to be able to resolve THz and laser pulses on the time scale of a few 10 ps, for high damage threshold, and broadband sensitivity. The capability of simultaneous measurement of optical and THz pulses with the same receiver allows for precise timing of these pulses in pump-probe experiments, a major class of experiments at such facilities.