

# Linearity of Air-Biased Coherent Detection for Terahertz Time-Domain Spectroscopy - DTU Orbit (09/11/2017)

## Linearity of Air-Biased Coherent Detection for Terahertz Time-Domain Spectroscopy

The performance of air-biased coherent detection (ABCD) in a broadband two-color laser-induced air plasma system for terahertz time-domain spectroscopy (THz-TDS) has been investigated. Fundamental parameters of the ABCD detection, including signal-to-noise ratio (SNR), dynamic range (DR), and linearity of detection have been characterized. Moreover, the performance of a photomultiplier tube (PMT) and an avalanche photodiode (APD) as photodetector in the ABCD have been compared. We have observed nonlinear behavior of PMT detector, which leads to artificial gain factor in TDS spectroscopy. The APD turns out to have superior linearity and three times higher dynamic compared to the PMT.

### General information

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