

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Enhancement of wideband terahertz-beam signals by a CW laser beam, in time-domain terahertz spectroscopy DONG HO WU, Naval Research Laboratory, BENJAMIN GRABER, Temple University — In time-domain terahertz spectrometry (TDTS) a wide terahertz beam is produced by irradiating a femtosecond laser pulse onto a terahertz emitter, typically a semiconductor slab or an electro-optic material. Since a compact TDTS uses a small femtosecond laser, its terahertz signal is weak, and the resulting terahertz spectrum is often ambiguous. Our recent experiments have shown that irradiating the emitter with an additional CW laser beam along with a femtosecond laser beam can enhance the wideband terahertz signal. Such an enhancement is possible, because an additional CW laser beam increases the photocurrents in the terahertz emitter, which in turn increases the terahertz output – a time derivative of the photocurrents. While the power of the wideband terahertz beam increases with the addition of CW laser beam power, small variations in the terahertz spectrum have also been observed with the addition of the CW beam. The variations in the terahertz spectrum could be due to the power fluctuations of the CW laser beam, or it could be due to the overall spectral modification in the combined laser beams as the spectrum of CW laser was slightly different from that of the femtosecond laser. Details of the terahertz-beam variations, as well as various applications of this enhanced TDTS, will be discussed in the presentation.

Dong Ho Wu
Naval Research Laboratory

Date submitted: 19 Nov 2009

Electronic form version 1.4