



Contribution ID: 339

Type: Oral Presentation

Construction of a Terahertz time domain spectrometer

Thursday, 10 July 2014 10:00 (20 minutes)

Abstract content ** ** **(Max 300 words)** **Formatting &** **
Special chars**

Terahertz time domain spectroscopy (THz-TDS) is still a relatively new research field. It has only recently through technological advances become relatively easy to produce coherent terahertz radiation. This easy access has opened up many new areas of research with THz radiation finding application in fields as diverse as communication, biophysics and security. It is especially the field of biophysics or biophotonics that is gathering significant interest. This is because many large biological molecules (proteins, DNA, etc.) show ro-vibrational absorption states in this region of the electromagnetic spectrum. THz-TDS therefor allows for a relatively easy method of investigating these molecules in different environments.

This talk will focus on the technical aspects concerning the construction and alignment of a THz-TDS setup which has been built at the Laser Research Institute, Stellenbosch University. The setup employs a femtosecond laser to trigger a biased photoconductive antenna as THz emitter. A second unbiased photoconductive antenna is used as detector. The electric field of the generated broadband THz pulse is measured in the time domain through a cross-correlation technique. Preliminary results recorded with this setup will be shown and compared to those obtained with a commercial setup. Examples of spectra recorded with a commercial system will also be shown and discussed as further examples of THz-TDS.

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Level for award **
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 ** **PhD)?**

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Would you like to **
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Session Classification: Photonics

Track Classification: Track C - Photonics