Time-domain Terahertz Spectroscopy: Principles and applications

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<p>Time-domain terahertz (TD-THz) spectroscopy has emerged as a valuable tool for studying material properties in the THz region of the electromagnetic spectrum. Many classes of materials exhibit characteristic absorption signatures in this previously unstudied portion of the electromagnetic spectrum. This opens up the possibility for non-destructive and non-invasive testing and analysis of materials which previously have proven difficult. Time domain T Hz spectroscopy entails measuring the electric field of the generated THz pulse in the time domain, and extracting the spectral information from the pulse through a Fourier Transform. Two main mechanisms for generating short, broadband THz pulses have emerged namely optical rectification in a nonlinear crystal of a femtosecond laser pulse and THz generation from a photo-conductive antenna (PCA). Recently, a photo-conductive antenna TD-THz setup has been established at the Laser Research Institute, University of Stellenbosch. This presentation will focus on the basic principles of operation and on the layout of the setup as well as the possible applications envisaged using the setup.

Level (Hons, MSc,
   PhD, other)?

other

Consider for a student
   award (Yes / No)?

No

Would you like to <br> submit a short paper <br> for the Conference
 Proceedings (Yes / No)?

No

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