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## Construction of a terahertz time-domain ellipsometer

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Terahertz time-domain spectroscopy is a powerful spectroscopic tool. Due to the long wavelength of terahertz radiation, it has a high penetration depth, thus allowing for high resolution at low intensity, and low photon energy, making it ideal for non-destructive spectroscopy. Normally terahertz spectroscopy is performed in transmission, due to the simplicity of such a setup and extracting information from the transmission data. Transmission setups have limitations unfortunately. Terahertz radiation is strongly absorbed by water and thus it is near impossible to analyse a sample in an aqueous environment, nor any other material that is optically dense to terahertz radiation. To investigate such samples, it would be preferable to work in reflection, but conventional reflection setups in terahertz spectroscopy are very difficult to construct due to the accuracy required in the positioning of the reference sample relative to the sample of interest in order to ensure the reliability of the measurement. To circumvent this problem, we constructed an ellipsometer with no need for a reference sample. In this talk we will be discussing the terahertz time-domain spectroscopic ellipsometer we have constructed, as well as measurements performed with this setup.

### Summary

In this talk we will be discussing the terahertz time-domain spectroscopic ellipsometer we have constructed, as well as measurements performed with this setup.

**Apply to be considered for a student award (Yes / No)?**

yes

**Level for award (Hons, MSc, PhD, N/A)?**

PhD

**Main supervisor (name and email) and his / her institution**

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

No

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