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Data extraction techniques for terahertz time-domain ellipsometry

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Terahertz (THz) radiation is a powerful tool for non-destructive spectroscopy and has the potential of being useful in analysing biological materials. Due to the strong absorption of THz radiation by water, a reflection-based geometry is required when investigating samples in an aqueous medium. Due to the relatively low alignment tolerance in THz time-domain spectroscopy it is preferable to implement a technique that does not depend on the need for a reference measurement when performing reflection-based measurements. Ellipsometry has been implemented to this end.

The construction of a THz ellipsometer has been completed, but to make use of the measured data, analysis algorithms need to be implemented and tested.

The development of these algorithms, which are model dependent and are applicable to specific cases, will be discussed. The cases investigated are bulk isotropic samples, single-layer isotropic samples and two-layer isotropic systems where the second layer is a bulk isotropic layer.

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