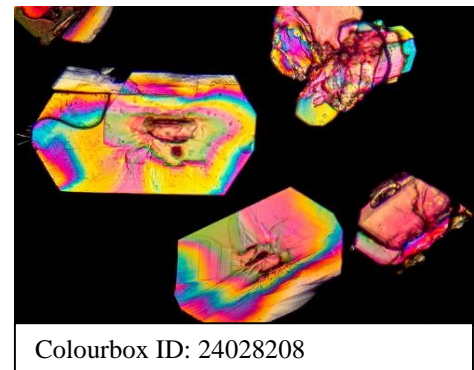


Master-Thesis

Terahertz Polarization Imaging Using Si-Integrated Circuits for Foreign Objects Detection

Spectral imaging provides information about the molecular and composition of an object, polarimetric imaging contains information about the shape and texture of the surfaces, the orientation of light emitters, and electromagnetic activity of various materials. This information is useful in many applications such as biomedical, remote sensing, quality control, materials detection, etc.



In this work, state-of-the-art an in-house built, fully silicon-integrated dual-polarized sensor will be implemented to perform both, transmission- and reflection-mode terahertz imaging of real objects. The goal is to demonstrate the working concept of polarimetric imaging using robust fully integrated sensors by developing a fully functional imaging set-up, automating the instrumentations, and data processing. The student will have an opportunity to get first hands-on experience in designing, mounting, testing, and analysing large sets of data on novel terahertz polarimetric imaging.

Requirements:

- Basic knowledge of terahertz imaging and sensing
- Basic knowledge of RF detectors
- Knowledge of silicon integrated circuits would be an advantage but not mandatory
- Hands-on experience in programming with Python or MATLAB would be a big plus

By finishing the Masters thesis successfully, the student will have gain experience and increased her/his employability in the following sectors:

- Remote Sensing
- Biomedical imaging
- Signal processing
- Automation and data-science

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