Institute of Applied Physics
Friedrich-Schiller-Universität Jena

Internship, Research Labworks, Bachelor Thesis, Master Thesis

in the subject area of

Miniaturized Scatterometry

Scatterometry is an optical measurement method that is mainly used in the semiconductor industry. It is possible to determine finest structural details of nanostructures far below the Abbe resolution criterion and to achieve measurement uncertainties in the sub-nanometer range.

For that, the characteristic change in the polarization state and the absolute intensity of the light reflected or transmitted by a sample at different wavelengths and angles of incidence is determined. The structure can then be inferred via inverse modelling. Typically, such measuring systems are very large and require a large number of moving components. The nano-optical polarizers and retarders developed in the research group promise to make it possible to integrate such setups directly on optical sensors in a robust and highly miniaturized way in the future.

Covered subjects

Several bachelor's theses (or master's theses) are possible in this subject area.

- Optical ray tracing analysis of the structure
- Investigation of the manufacturing influence (deviations from the ideal structural form) on the achievable measurement uncertainty
- development of design concepts
- Investigation of the production of corresponding nano-optical components
- Realization of an experimental set-up for the experimental verification of the theoretical predictions
- Development of data analysis and error compensation

Contact for further information and application:

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