Friedrich-Alexander-Universität
Technische Fakultät

The **Institute of Advanced Optical Technologies – Thermophysical Properties (AOT-TP)** offers a

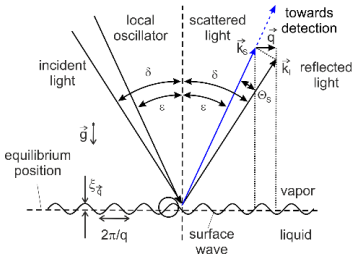
Position as Research Assistant (m/f/d) with the perspective of a doctorate

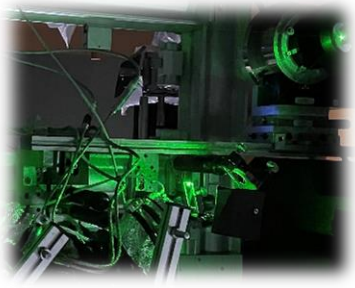
for a research project with the tentative title

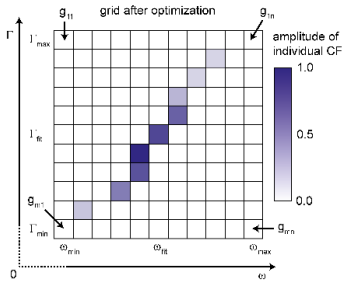
Accurate determination of viscosity and interfacial tension by surface light scattering for non-transparent fluids

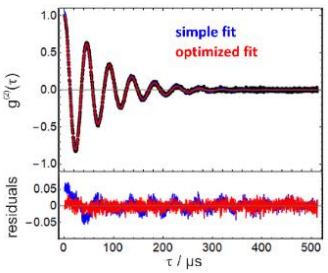
For transparent fluids, Surface Light Scattering (SLS) is a well-established technique for the determination of viscosity and surface or interfacial tension with high accuracy in a non-invasive way at macroscopic thermodynamic equilibrium. Continuous developments of the SLS technique open up further application possibilities in thermophysical property research with strong reference to process engineering, including its on-line or in-line operation. Here, process-relevant fluids are often opaque and non-transparent, which is why SLS experiments need to be performed in reflection geometry employing small wave vectors of the probed surface fluctuations. In this range, however, line-broadening effects originating from experimental uncertainties in the definition of the wave vector are present, which cause a systematic over- and underestimation of the determined viscosity and surface tension, respectively. To address this problem, physically solid evaluation approaches and a proper design of the experiment are required, yet lacking so far.

The scope of the project is to develop the SLS method for an accurate determination of viscosity and surface or interfacial tension for non-transparent fluids, where the method is preferably applied in the range of small wave vectors. For this, both theoretical and experimental work will be necessary. The theoretical work includes the further development of the data evaluation strategies, which in case of a successful evaluation includes the optimization of the program codes used. Complementary, experimental investigations will be carried out on selected systems. This should allow to validate the evaluation procedure and to examine whether additional adaptions to the existing setup are necessary for its reliable application in the range of small wave vectors.









The project is thematically located in the fields of optics and material property research for process technology. Therefore, we are looking for a graduated researcher with strong interests in the fields of optics and thermophysical property research. We offer a multidisciplinary and international working environment with excellent potential for scientific and personal development.

Project start: as soon as possible

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