SFB 1194
“Interaction between Transport and Wetting Processes”

A02
Experimental Investigation of Coalescence and Breakup of Droplets on Solid Surfaces – Generic Configuration Sessile Drop

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People

Principle investigator: Dr. Günter K. Auernhammer
Person working on the project: Peyman Rostami

Abstract:

Fluids with complex rheology play a role in many practical coating processes, e.g. viscoelastic fluids. In line with the SFB agenda, the focus will increasingly be on complex fluids and substrates. As a model system for viscoelastic fluids, polymer solutions will be used and the coalescence of droplets will be investigated. Such fluids can have shear rate dependent viscosity or frequency dependent viscoelastic properties. Phase separation can also occur if a mixture of different polymers is present. Due to the strong gradients near moving contact lines, it is expected that there will be a pronounced coupling between the internal viscoelastic properties of the fluids and the dynamics of the wetting and dewetting. Furthermore, the space of substrate properties under consideration will be extended, e.g. by investigating substrates with temperature gradients.

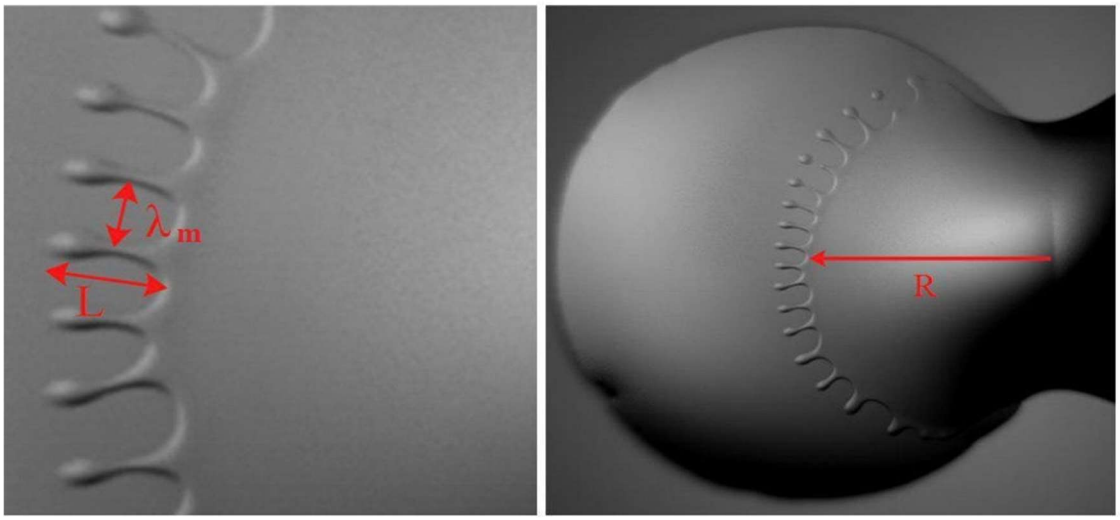

Fig: Instability during drop merging of partially miscible drops.

Details

Time frame: 07/2020 until 06/2024
Link: **https://www.sfb1194.tu-darmstadt.de/**
Funding agency: Deutsche Forschungsgemeinschaft (DFG), Project number 265191195

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   Forced dynamic dewetting of structured surfaces: Influence of surfactants.
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   Flow profiles near receding three-phase contact lines: Influence of surfactants
   arXiv:2105.12365 [physics.flu-dyn]
   https://arxiv.org/abs/2105.12365

A06
Flow Velocity Profile near a Moving Three-phase Contact Line

People

Principle investigator: Dr. Günter K. Auernhammer
Person working on the project: Peyman Rostami

Abstract

A06 focuses on the measurement of flow profiles in complex liquids near the three-phase contact line using microscopic particle tracking. The aim is to clarify how e.g. local layer formation in suspensions, shear thinning or thickening affect the wetting dynamics and vice versa. In dewetting, a distinction must be made between pinning and non-pinning. Results will be compared with those of complementary experiments on complex surfaces. This will provide validation data for model development and simulation in different situations.

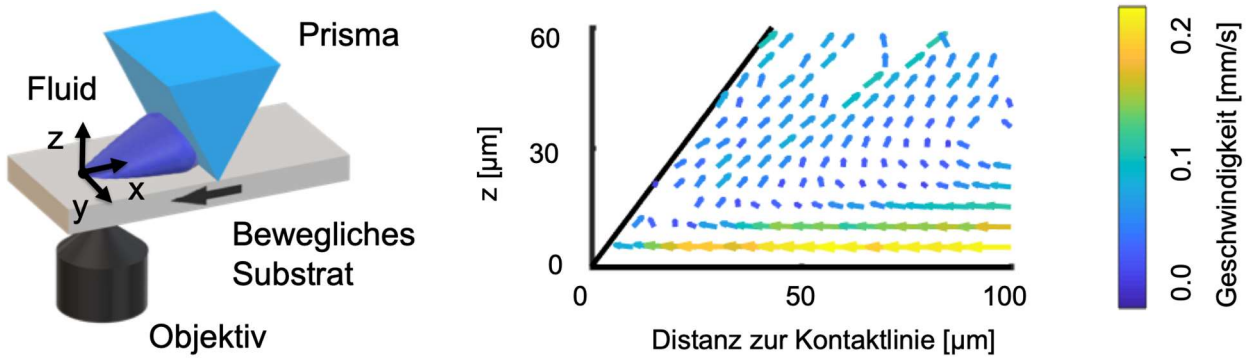

Fig: Design of the drop slider to measure flow profiles in moving drops.

Details

Time frame: 07/2020 until 06/2024
Link: **https://www.sfb1194.tu-darmstadt.de/**
Funding agency: Deutsche Forschungsgemeinschaft (DFG), Project number 265191195

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