

Equilibrium droplets between experiment and theoretical predictions

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In this study we are interested in Polystyrene liquid droplets in equilibrium on PDMS elastic solid substrates in the limit of the electrocapillary length, and consequently to the ratio between the surface tensions and the elasticity of the substrates. An experimental analysis using Atomic Force Microscopy of the different parameters constituting the shape of micron-sized droplets in both the free interface and the interface in contact with the PDMS (obtained using a lift-off technique) are compared to our theoretical model where we establish a general framework for coupling phase fields to mechanics in form of a gradient-flow structure. This leads to a thermodynamically consistent model that allows for different types of coupling and dissipation mechanisms. For this, we construct robust numerical algorithms based on an incremental minimization scheme. We can then use this tool to investigate different orders of magnitude of capillary length

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Sitzung Einordnung: Short Talks