

Modeling and Simulation of Transport Processes at Fluidic Interfaces

Dieter Bothe

Center of Smart Interfaces, TU Darmstadt

Abstract:

This talk surveys recent efforts to simulate transport processes at fluid interfaces, employing sharp interface continuum mechanical models and building on the Volume of Fluid method. We report on extensions and improvements which allow for physically sound direct numerical simulations.

Specific aspects are the stabilization of thin fluid lamellae to capture the hydrodynamics of droplet collisions, a two-scalar approach for mass transfer simulations at bubbles and drops, an improved computation of interfacial temperature fields in order to correctly capture evaporation with thermal Marangoni effects as well as techniques to account for transport of adsorbed species on fluidic interfaces.