

Weak solutions to a Navier-Stokes/Mullins-Sekerka system with different densities

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In this talk, I would like to introduce a model for the flow of two incompressible, viscous and immiscible fluids in a bounded domain, with different densities and viscosities. This model consists of a coupled system of Navier–Stokes and Mullins–Sekerka type parts, and can be obtained from the asymptotic limit of the diffuse interface model introduced by Abels, Garcke, and Grün in 2012. I will introduce a new notion of weak solutions and prove its global in time existence, together with a consistency result. This new notion of solution allows to include the case of different densities of the fluids, a sharp energy dissipation principle à la De Giorgi, as well as a weak formulation of the constant contact angle condition at the boundary, which were left open in the previous notion of solution proposed by Abels and Röger in 2009. This is a joint project with Helmut Abels.