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Dewetting of thin liquid bilayers

In this talk we consider a liquid-liquid bilayer with negative spreading coefficient. In the resulting flow one liquid retracts from other liquid and ultimately forms lens-shaped droplets, where the two contact angles are determined by the Neumann-triangle construction. We shortly introduce the application of liquid-liquid dewetting in a microfluidic setting and show how a corresponding model and a weak formulation can be obtained by a variational principle. The transition from dry to wet substrate can be regularized using a thin precursor layer, for which we study the limiting problem when the thickness of that layer approaches zero. For the limiting problem and with suitable boundary conditions a simple proof of existence and uniqueness of energy minimizers is given. Computing numerical solutions we compare dynamical solutions with recent experiments.