Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

Contact Line Dynamics GUNILLA KREISS, HANNA HOLMGREN, Uppsala Univ, MARTIN KRONBICHLER, TU Munich, ANTHONY GE, LUCA BRANT, KTH Stockholm — The conventional no-slip boundary condition leads to a non-integrable stress singularity at a moving contact line. This makes numerical simulations of two-phase flow challenging, especially when capillarity of the contact point is essential for the dynamics of the flow. We will describe a modeling methodology, which is suitable for numerical simulations, and present results from numerical computations. The methodology is based on combining a relation between the apparent contact angle and the contact line velocity, with the similarity solution for Stokes flow at a planar interface. The relation between angle and velocity can be determined by theoretical arguments, or from simulations using a more detailed model. In our approach we have used results from phase field simulations in a small domain, but using a molecular dynamics model should also be possible. In both cases more physics is included and the stress singularity is removed.

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Date submitted: 25 Jul 2017 Electronic form version 1.4