Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

Numerical investigation of sliding drops on an inclined surface DOMINIQUE LEGENDRE, ANNAIG PEDRONO, IMFT, INTERFACE GROUP TEAM — Despite it apparent simplicity, the behavior of a drop on an inclined solid surface is far to be properly reproduced by numerical simulation. It involves static, hysteresis and dynamic contact line behaviors. Depending on the fluid properties, the hysteresis and the wall inclination, different drop shapes (rounded, corner or pearling drop) can be observed. The 3D numerical simulations of sliding droplets presented in this work are based on a Volume of Fluid (VoF) solver without any interface reconstruction developed in the JADIM code (Dupont & Legendre J. Comp. Phys. 2010). The surface tension is solved using the classical CSF (Continuum Surface Force) model and a sub grid model is used to describe under hysteresis conditions both the shape, the dissipation of the non resolved scales of a moving contact line. Numerical simulations are compared with the experiments of LeGrand et al. J. Fluid Mech. 2005. The agreement with experiments is found to be very good for both he critical angle of inclination for siding as well as for the specific shapes: rounded, corner and pearling drops. The simulations have been used to extend the range of hysteresis covered by the experiments.

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Date submitted: 26 Jul 2017 Electronic form version 1.4