Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

The bifurcation diagram of drops in a sphere/ plane geometry: influence of contact angle hysteresis RIËLLE DE RUITER, MATHIJS VAN GORCUM, MESA+ Institute for Nanotechnology, University of Twente, CIRO SEMPREBON, Max-Planck-Institute for Dynamics and Self-Organization, MICHÈL DUITS, MESA+ Institute for Nanotechnology, University of Twente, MARTIN BRINKMANN, Max-Planck-Institute for Dynamics and Self-Organization / Saarland University, FRIEDER MUGELE, MESA+ Institute for Nanotechnology, University of Twente — We study liquid drops that are present in a generic geometry, namely the gap in between a sphere and a plane. For the ideal system without contact angle hysteresis, the drop position is solely dependent on the contact angle, drop volume, and sphere/ plane separation distance. Performing a geometric analysis and Surface Evolver calculations, a continuous and fully reversible transition between axisymmetric non-spherical shapes and non-axisymmetric spherical shapes is predicted. We also study these transitions experimentally, varying the contact angle using electrowetting. Then, pinning forces drastically alter the pitchfork bifurcation as the unstable branch gets stabilized, and introduce a history-dependence in the system. As a consequence, the outward movement of drops following pinning can be either continuous or discontinuous, depending on the minimum contact angle that is attained.

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Date submitted: 01 Aug 2014 Electronic form version 1.4