

Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

Numerical simulations of a ferrofluid drop on a substrate under an applied magnetic field IVANA SERIC, SHAHRIAR AFKHAMI, LOU KONDIC, New Jersey Institute of Technology — Understanding the behavior of a ferrofluid drop on a surface is of direct relevance to applications such as adaptive liquid lens optics. Here, we consider a ferrofluid drop on a horizontal substrate subjected to an applied uniform magnetic field with a non-magnetizable passive gas atop. Governing equations are the static Maxwell equations coupled with the incompressible Navier-Stokes equations. We use the long wave approximation to derive the equation that governs the non-linear evolution of the drop interface. Contact angles are imposed through the disjoining pressure model. The evolution equation is solved numerically and the results are compared with data from experiments.

Ivana Seric
New Jersey Institute of Technology

Date submitted: 30 Jul 2013

Electronic form version 1.4