Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Width of a Ferrofluid Finger: Hysteresis and Multiple Energy Minima NARELLE HILLIER, DAVID JACKSON[1], Dickinson College — The theoretical finger width dependence of a ferrofluid on the magnetic field in a Hele-Shaw geometry is investigated. A model of the finger enables the energy to be computed and then minimized to determine the finger width. Calculations predict a hysteresis effect as the applied magnetic field is varied. This results from the existence of two local energy minima for a range of magnetic bond numbers. Hence, for a given magnetic bond number, the stable ferrofluid configuration can be either a circle or a finger, depending on the whether the applied field is increasing or decreasing. A comparison with experimental results will be presented.

[1]To whom correspondence should be addressed

Narelle Hillier
Dickinson College

Date submitted: 11 Jan 2006 Electronic form version 1.4