Abstract Submitted
for the DFD06 Meeting of
The American Physical Society

Thermocapillary migration of a drop at a fluid interface EDWIN GRECO, ROMAN GRIGORIEV, Center for Nonlinear Science and School of Physics, Georgia Institute of Technology — Employing the thermocapillary effect to manipulate a liquid droplet trapped at a fluid-fluid interface has been proposed as a foundation for an optically controlled microfluidic device. We solve the Stokes equations for such a system, subject to a linear temperature gradient at infinity. The presence of a temperature gradient will induce surface tension variations along the fluid-fluid interfaces. These gradients, in turn, will give rise to a flow inside and outside of the droplet. The velocity and temperature fields are calculated numerically using a spectral collection scheme. We analyze the dependence of the flow structure and the drop migration velocity on the dimensionless parameters characterizing the problem.

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Date submitted: 05 Aug 2006 Electronic form version 1.4