

Abstract Submitted
for the DFD09 Meeting of
The American Physical Society

Computational Study of Moving Stripe Lines NEEHARIKA ANANTHARAJU, MAHESH PANCHAGNULA, SRIKANTH VEDANTAM, Tennessee Technological University — Wetting of chemically heterogeneous surfaces is modeled using phase field theory. This model studies the one-dimensional kinetic processes involved in wetting a substrate similar to a Wilhelmy technique. The experimental technique provides a complete validation due to its capability to capture the triple line kinetics in addition to measuring the contact angles during the advancing and receding processes. A chemically heterogeneous surface is said to be composed of a predetermined arrangement of two materials. The novelty in the current approach lies in the fact that each of the component materials is constitutively allowed to exhibit hysteresis. We investigate the local shape of the triple line which plays an important role in determining the macroscopic contact angle due to its ability to be pinned at various defect locations on real surfaces. We also demonstrate that the shape of the advancing and receding triple line is sensitive to the specific arrangement of the two materials.

Neeharika Anantharaju
Tennessee Technological University

Date submitted: 11 Aug 2009

Electronic form version 1.4