

Abstract Submitted
for the DFD05 Meeting of
The American Physical Society

A multi-scale study of moving contact-lines XIAOBO NIE, MARK ROBBINS, Department of Physics and Astronomy, The Johns Hopkins University, SHIYI CHEN, Department of Mechanical Engineering, The Johns Hopkins University — A continuum-atomistic multi-scale method has been developed to study moving contact-lines based on our previous hybrid method (X. B. Nie et al, *JFM* 2004 V. 500, pp 55-64, *Phys. Fluids* 2004, V. 16, pp 3579-3591.). A small inner region near the contact-line is simulated by molecular dynamics and the large remaining region is described using the Navier-Stokes equations with no-slip boundary conditions. Results are presented for two immiscible fluids confined in a channel between two rigid substrates. The dependence of contact angle on capillary number, channel width, and distance from contact line have been studied and compared with analytic and numerical solutions of the Navier-Stokes equations supplemented with heuristic models.

Xiaobo Nie
Department of Physics and Astronomy, The Johns Hopkins University

Date submitted: 10 Aug 2005

Electronic form version 1.4