Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Coalescence of liquid drops SANTOSH APPATHURAI, MICHAEL HARRIS, OSMAN BASARAN, Purdue University, JOSEPH PAULSEN, JUSTON BURTON, SIDNEY NAGEL, University of Chicago — Drop coalescence plays a central role in industrial contexts, e.g. emulsions, sintering processes, and inkjet printing, as well as in everyday phenomena ranging from dripping faucets to raindrops in clouds. During coalescence, two drops touch each other and then merge as a liquid bridge grows from microscopic scales to a size comparable to the drop diameter. This process has been thought to have just two regimes: a highly viscous one during the initial stages, pulling the drops together, and an inertial one later on, dominated by interface deformations near the neck. We use high-speed imaging, electrical measurements and full Navier-Stokes simulations to reveal a new regime that governs the asymptotic dynamics of coalescence for any finite viscosity in three dimensions.

Osman Basaran
Purdue University

Date submitted: 05 Aug 2011 Electronic form version 1.4