

Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

Formation and dynamics of partially non-wetting droplets in square microchannels¹ BIBIN M. JOSE, THOMAS CUBAUD, Stony Brook University — We experimentally study the formation and evolution of partially non-wetting droplets in microchannels made of glass and silicon. Droplets are generated by focusing pure water in an external phase of silicone oil using square microchannels. To probe the influence of the capillary number on droplet behavior in confined geometries, the oil viscosity is varied over four decades. For each fluid pair, the critical speed associated with the dynamic wetting transition is experimentally determined using a contact angle goniometer equipped with a high-speed camera. We discuss a variety of wetting phenomena in microchannels. In particular, we focus on the droplet lubrication transition from low to large capillary numbers and we examine droplet velocity as a function of droplet length, flow rates, and dynamic wetting properties.

¹This work is supported by NSF (CBET- 1150389)

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Date submitted: 26 Jul 2013

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