

Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

The early stages of drop wetting when surrounded by an immiscible liquid¹ ALEXANDROS ORATIS, MARK MENESSES, JAMES BIRD, Boston University — When a liquid drop comes into contact with a solid, the drop will typically spread over the solid's surface. Similarly, when a rising air bubble touches an immersed solid, it will also spread under the appropriate wetting conditions. The rates at which drops and bubbles spread over partially wetting solid surfaces at early stages have been shown to exhibit dynamics that depend on the liquid properties and the wettability of the surface. However, there is a discrepancy in the dynamics between the two systems. The initial spreading rate of low viscosity drops in air is inertially dominated; whereas, the initial spreading rate of air bubbles in liquids has been shown to be viscously dominated. Motivated by this contrast in behaviors, we study whether this discrepancy still occurs when the air phase in these systems is replaced by a second liquid. In particular, we investigate the spreading dynamics of a liquid drops surrounded by another immiscible liquid for various liquid pairings. The ultimate aim of this research is to provide insight into contact line dynamics.

¹Partially supported by the Office of Naval Research under Grant Number award N00014-16-1-3000

Alexandros Oratis
Boston Univ

Date submitted: 01 Aug 2017

Electronic form version 1.4