

Abstract Submitted
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Droplet dynamics in microfluidic stratifications¹ THOMAS CUBAUD, BIBIN M. JOSE, SAMIRA DARVISHI, RUOPENG SUN, Stony Brook University — We experimentally study the dynamic response of viscous droplets to external microflows. A segmented flow of droplets is injected into a stratified flow of miscible fluids using a square microchannel with two focusing sections. This method enables us to locally manipulate the capillary number of the continuous phase and examine the hydrodynamic coupling between droplets and a variety of flow fields in confined geometries. Focus is on the behavior of droplets entering a region with parallel streams having different interfacial tensions and viscosities. A general phase-diagram is proposed and droplet behavior is investigated in relation with dynamic wetting properties. This study shows methods for modifying the physicochemical environment of microfluidic droplets.

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