

DFD12-2012-001552

Abstract for an Invited Paper
for the DFD12 Meeting of
the American Physical Society

Tipstreaming and other methods of producing fine fluid threads

SHELLEY ANNA, Carnegie Mellon University

Capillary breakup has long been used to generate uniform fluid droplets, but capillary breakup alone does not easily yield drop sizes below the micrometer scale. Additional factors can be combined to effectively promote uniform small-scale breakup. A well-established example is the use of piezoelectric forcing, such as in inkjet printing. More recent approaches to forming micron and submicron droplets include microfluidic methods using confined geometries, use of interfacial tension gradients including tipstreaming to produce fine threads, and electrosprays and electrohydrodynamic jetting. These methods aid in the generation of fine fluid threads that subsequently fragment due to capillarity. In this talk I will compare these methods of producing uniform micron and submicron droplets, and I will discuss in particular recent work to describe and control surfactant-mediated tipstreaming in microfluidic devices.