

Abstract Submitted  
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**Dynamics of viscous droplets in microfluidic cross-flows** THOMAS CUBAUD, Stony Brook University, Department of Mechanical Engineering — Cross-flow injections are used to experimentally investigate the dynamic response of individual viscous droplets to a sharp increase of their velocity in a square microchannel. As a basis for diluting emulsions on-chip, a train of droplets is subjected to an additional injection of the continuous phase from symmetric side-channels. The local modification of the flow velocity produces a broad range of dynamics, including the formation of unstable slender viscous structures and intriguing 'spoon-like' droplets. Deformations and relaxation times are examined as a function of flow and fluids properties with a particular emphasis on the break-up conditions of high-viscosity droplets.

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