

Abstract Submitted
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Dispersion of suspension plugs in microchannels MARTIN MAXEY, GLAREH AZADI, ANUBHAV TRIPATHI, Brown University, KYONG-MIN YEO, Lawrence Berkeley National Laboratory — Plugs of beads can be used as a model for understanding the behavior of suspensions in microfluidic devices. Despite a large volume of literature in the field of microfluidic suspension flows; the fundamental understanding of the dispersion of hard and soft particle suspension plugs of finite length has not been studied in detail. Here we focus on the dispersion characteristics of non-Brownian, low Reynolds number bead suspensions in microfluidic channels. The effect of initial plug length, bead size and dilution on the early stages of dispersion of these beads in a pressure driven flow will be presented. Numerical simulations of suspension shear flow for test configurations relevant to plug dispersion have been performed in order to present a new level of continuum models for particle stresses and particle fluxes in confined shear flows. These results can contribute to the design of high throughput microfluidic systems for cell screening and bio-separation.

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