

Abstract Submitted
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Vorticity alignment of rigid fibers in oscillatory flow JASON BUTLER, BRADEN SNOOK, Dept. of Chem. Engr., University of Florida, DEPT. OF CHEM. ENGR., UNIVERSITY OF FLORIDA TEAM — Rigid fibers suspended at high concentration in a viscous, Newtonian fluid can be aligned perpendicular to the flow-gradient plane by applying an oscillatory shear flow. Direct comparisons with published experiments of Franceschini and coworkers [Phys. Rev. Letters 107, 250603 (2011)] demonstrate that a simple model, which considers only excluded volume and self-mobilities, can accurately predict the orientation distributions. However simulations reveal that this surprising alignment occurs only if the ratio of the gap width to fiber length is small (i.e. a highly confined suspension). Stresses calculated from the numerical simulations are also reported and compared to the experimentally measured rheology.

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