

Abstract Submitted
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Particle Segregation in the Presence of Oscillating Straining Flows¹ JEFFREY MARSHALL, The University of Vermont — Numerical experiments performed using a discrete-element method for both adhesive and non-adhesive particles have demonstrated that particles placed in an oscillating straining flow will drift toward the nodal points of straining – a phenomenon that we refer to as *oscillatory clustering*. A theory explaining this phenomenon is proposed and used to predict the particle drift rate, which is found to increase with increase in particle Stokes number up to a stability limit. The theory also predicts that in the presence of gravitational force, particles will exhibit a limit cycle behavior in which they oscillate under the opposing downward gravitational drift and upward drift due to oscillatory clustering. Computations are performed to demonstrate the effects of this phenomenon for particles in an oscillating box, for peristaltic pumping of a particulate suspension, and for a suspension flowing through a corrugated tube.

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