Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Homogenizing a viscous suspension without fine tuning JIKAI WANG, JENNIFER SCHWARZ, JOSEPH PAULSEN, Syracuse Univ — Particle suspensions, present in many natural and industrial settings, typically contain aggregates and other microstructures. The breaking up of such inhomogeneities can ease processing demands. Recent work has shown that applying uniform periodic shear near a critical transition can lead to an extremely homogeneous spatial distribution of particles. However, this strategy requires fine-tuning of the strain amplitude. Here we explore a model of sedimenting particles under periodic shear. Previous work [1] found that for particles that sink slower than a finite threshold speed, the system is automatically driven towards a critical state. Our simulations and scaling arguments reveal a different phase boundary this behavior. Within the slow-sedimentation regime, we show that the critical state is robust at homogenizing the suspension. [1] Corte et al., Phys. Rev. Lett. 103, 248301 (2009).

Jikai Wang
Syracuse Univ

Date submitted: 11 Nov 2016 Electronic form version 1.4