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Criticality of non-colloidal suspensions under periodic shear[1] EMMANOUELA FILIPPIDI, DAVID PINE, Center for Soft Matter Research, NYU — Suspensions of non-colloidal particles under slow periodic strain undergo a dynamical phase transition: they can either relax to an absorbing configuration in which particles are not displaced after every cycle or can reach a stationary fluctuating state. We correlate microscopic particle motion with macroscopic rheology and explain the existence of the critical transition experimentally by comparing particles of different surface roughness and by varying the volume fraction towards jamming. Particle roughness is implicated in the transition to reversibility, as smoother particles push the critical strain to higher values. Theoretically, we attempt to construct quasi-particles that encompass the strain-induced particle interactions and discover that geometry is not sufficient to understand suspension irreversibility under strain.

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