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Oscillating particles in passive concentrated suspensions JUAN LUIS ARAGONES, JOSHUA STEIMEL, ALFREDO ALEXANDER-KATZ, MIT — We have studied the phase behavior of oscillating active particles in concentrated suspensions using Langevin Dynamics. We compare our simulation results with experiments carried out using paramagnetic beads under an oscillating magnetic field in dense colloidal monolayers. We observe phase separation induced by the non-equilibrium nature of these active particles, termed *oscillators*, at high densities both in pseudo-2D (i.e. monolayers) and 3D. In addition, we report different behaviors depending on the oscillation period, amplitude and concentration of active particles. When hydrodynamic interactions are explicitly taken into account by using Lattice-Boltzmann simulation, we further observe complex behaviors such as the formation of vortices around the rotating particles. This system is particularly interesting for the design and refines materials.

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