Abstract Submitted
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Dynamic phases in non-equilibrium magnetic colloids at liquid interfaces under in-plane magnetic field driving[1] ALEXEY SNEZHKO, Argonne National Laboratory, USA, GASPER KOKOT, Josef Stefan Institute, Ljubliana, Slovenia, DAVID PIET, Argonne National Laboratory, IGOR ARANSON, Argonne National Laboratory, USA — Ensembles of interacting colloidal particles subject to an external periodic forcing often develop nontrivial collective behavior. We study emergent phenomena in magnetic colloidal ensembles suspended at a liquid-air interface and driven out of equilibrium by alternating magnetic fields. We use ferromagnetic colloidal micro-particles (so the magnetic moment is fixed in each particle and interactions between colloids is highly anisotropic and directional) suspended over a water-air interface and energized by alternating magnetic fields applied in-pane of the interface. Experiments reveal new types of dynamic self-assembled phases (in particular, "wires," "rotators") emerging in such systems in a certain range of excitation parameters. Transition between different self-assembled phases with parameters of external driving magnetic field is observed. Molecular dynamic simulations captures some of the non-equilibrium self-assembled phases in our system.

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