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Dynamic self-assembly in far-from-equilibrium magnetic granular ensembles at the liquid/liquid interface ALEXEY SNEZHKO, IGOR ARANSON, Argonne National Laboratory — Magnetic particles suspended over an interface of two immiscible liquids and energized by a vertical alternating magnetic fields give rise to novel dynamic self-assembled structures ("pulsating magnetic stars," "clams") which are not accessible at the liquid/air interface. These novel structures is attributed to the interplay between surface waves, generated at the liquid/liquid interface by the collective response of magnetic microparticles to the alternating magnetic field, and hydrodynamic fields induced in the boundary layers of both liquids forming the interface. We show that while the onset of the dynamic self-assembly is controlled by the external driving magnetic field parameters the viscosity of the liquids forming the interface plays an essential role. Transition between different self-assembled structures with the parameters of the external excitations is observed.

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