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Structure formation in electromagnetically driven magnetic granular media ALEXEY SNEZHKO, IGOR ARANSON, WAI-KWONG KWOK, Materials Science Division, Argonne National Laboratory, 9700 S. Cass Avenue, Argonne, IL 60439 — We report structure formation in submonolayers of magnetic microparticles subjected to periodic electrostatic and magnetic excitations. Depending on the excitation parameters, rich variety of structures: clusters, rings, chains, and networks can be generated in the system. The growth dynamics and shapes of the structures are strongly dependent on the amplitude and frequency of the external magnetic field. It was found that for pure ac magnetic driving at low densities of particles, the low-frequency magnetic excitation favors clusters while high frequency excitation favors chains and net-like structures. An abrupt phase transition from chains to a network phase with the frequency of external ac magnetic field was observed for a high density of particles.

Oleksiy Snezhko
Argonne National Laboratory

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