Abstract Submitted
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Self-assembly of particles with anisotropic interactions[1] WOLFGANG LOSERT, JUSTIN STAMBAUGH, University of Maryland — We investigate the self-assembly of hard core particles with additional dipolar and higher order (in particular octopolar) interactions using a model system of vertically vibrated magnetic spheres. Self-assembly in such a driven dissipative system is similar to transitions to self-assembly seen in equilibrium polymerization. We show the crucial role of the anisotropy of interaction on the pattern of self-assembly in our experimental model system. In particular, we observe clusters, chains, and branched networks. We show that energy minimization in a simple point charge model can be used to predict the preferred self-assembly pattern. We also show that such a model containing a few carefully placed representative charges can successfully recreate self-assembly patterns in several related physical systems, including biological macromolecular self-assembly of e.g. tubulin.

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