

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Emergent collective phenomena in a mixture of hard shapes through active rotation MICHAEL ENGEL, NGUYEN NGUYEN, DAPHNE KLOTSA, SHARON GLOTZER, University of Michigan — We investigate collective phenomena with rotationally driven spinners of concave shape. Each spinner experiences a constant internal torque in either a clockwise or counterclockwise direction. Although the spinners are modeled as hard, otherwise non-interacting rigid bodies, their active motion induces an effective interaction that favors rotation in the same direction. With increasing density and activity, phase separation occurs via spinodal decomposition, as well as self-organization into rotating crystals. We observe the emergence of cooperative, super-diffusive motion along interfaces, which can transport inactive test particles. Our results demonstrate novel phase behavior of actively rotated particles that is not possible with linear propulsion or in non-driven, equilibrium systems of identical hard particles. Reference: arXiv:1308.2219

Michael Engel
University of Michigan

Date submitted: 15 Nov 2013

Electronic form version 1.4