Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Steady State Shear Driven Flow of Frictionless Spherocylindrical Particles in Two Dimensions[1] DANIEL VAN HOESEN, University of Missouri, THEODORE MARSCHALL, University of Rochester, SCOTT FRANKLIN, Rochester Institute of Technology, STEPHEN TEITEL, University of Rochester — We carry out simulations of a model of frictionless spherocylindrical rods in two dimensions, under uniform steady state shear driven flow. Rods repel elastically when they come into contact, and dissipate energy with respect to a uniformly sheared host medium. We pay particular attention to the tumbling motion of the rods that is induced by the shear flow, computing the average angular velocity, and the nematic and tetratic orientational order parameters. We find non-monotonic behavior of the orientational order parameters as the packing fraction increases toward the jamming transition. Orientational and translational correlation functions are computed to measure cooperative behavior as the packing fraction increases.

[1]Work supported by NSF grants CBET-1133126 and CBET-1435861 and by NSF award PHY-1156339. Computations carried out at the CIRC at the University of Rochester.

Daniel Van Hoesen
Univ of Missouri - Columbia

Date submitted: 12 Nov 2014 Electronic form version 1.4