Abstract Submitted
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Emergence of Order in Sheared Systems of Elliptical Particles[1]
SOMAYEH FARHADI, Duke University, Department of Physics, ROBERT P. BEHRINGER, Duke University — We have studied the emergence of order in shear-jammed systems composed of quasi-2D elliptical particles, using both biaxial and Couette shear. The particles are photoelastic ellipses with aspect ratio 2. Using photoelastic particles enables us to determine grain-scale forces, and hence the microscopic force structure of the system. We obtain forces by solving the inverse photoelastic problem for ellipses subject to boundary point forces, similarly to the approach that we have developed for circular particles. We will present data for local packing fraction, orientation and force. Using configurational and force data shows that local smectic order plays a crucial role in jamming of elliptical particles.

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