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Microstructure of Brownian Particles under Cyclic Shear[1] SOMAYEH FARHADI, University of Pennsylvania, NATHAN KEIM, California Polytechnic State University - San Luis Obispo, PAULO ARRATIA, University of Pennsylvania — We study the microstructure of a 2D colloidal system subject to cyclic shear. The system consists of $1\mu m$ particles which are purely repulsive and are adsorbed at an oil-water interface. The particles, which exhibit Brownian motion, provide a model system for thermal glasses under external shear. Cyclic shear is induced by a magnetized needle which is also placed at the interface. The particles are tracked through consecutive images taken within each cycle. By measuring the non-affine stroboscopic displacement of the particles, we identify the spatial distribution of rearrangements. Similar to nonthermal colloids $(4 - 6\mu m)$, we observe localized regions of non-affine rearrangements. The number and size of these regions shrink as the Pclet number is increased. We also observe that similar to non-Brownian systems, a fraction of reversible cycles undergo plastic deformation. However, the spatial distribution of such Brownian particles is more homogeneous compared to non-Brownian system.

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