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Observations of shear-induced clusters seen near the colloidal glass transition DANDAN CHEN, DENIS SEMWOGERERE, ERIC R. WEEKS, Emory University — Many studies of the glass transition focus on structural relaxation arising from thermally induced dynamics. Several of these studies observed isolated clusters of fast-moving particles. We present experimental work that finds similar heterogeneities from mechanically-induced motion applied to a dense colloidal suspension. We study micron-sized PMMA spheres with a volume fraction of approximately 50%. The sample is subjected to shear while simultaneously the dynamics are recorded using fast confocal microscopy. From the resulting 3D movie the trajectories of the individual particles are tracked and the macroscopically imposed shear is subtracted to study the mechanically-induced non-affine particle motion. We find fast-moving cooperative clusters with pronounced motion in the shear direction.

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