Abstract Submitted
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Local strain field fluctuations in quasi-two-dimensional colloidal glasses[1] YE XU, Laboratory for Research on the Structure of Matter, University of Pennsylvania, TIM STILL, Department of Physics and Astronomy, University of Pennsylvania, KEVIN APTOWICZ, Department of Physics, West Chester University, ARJUN YODH, Department of Physics and Astronomy, University of Pennsylvania — We investigate the local strain field fluctuations in a quasi-two-dimensional colloidal glass as a function of packing fraction as the jamming transition is approached. Using standard video microscopy and particle tracking techniques, we derive the best-fit affine strain tensor and the non-affinity for each particle in the sample; this information is obtained by analyzing the variations of local configurations around each particle due to thermal motion. The spatial and temporal distributions of this local deformation permit us to probe the mechanical properties of our colloidal systems. We study how these mechanical properties evolve as the systems approaches the jamming transition. Furthermore, we explore the connection between the mechanical heterogeneity and the onset of irreversible rearrangements.

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