

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**Experimental observation of deformation and structural defects in hard-sphere colloid glasses** KATHARINE JENSEN, Harvard University Department of Physics, NOBUTOMO NAKAMURA, Harvard University School of Engineering and Applied Sciences, DAVID WEITZ, Harvard University Department of Physics, Harvard University School of Engineering and Applied Sciences, FRANS SPAEPEN, Harvard University School of Engineering and Applied Sciences — We performed experiments on a 1.55- $\mu\text{m}$ -diameter monodisperse, hard-sphere colloid glass under simple shear at various strain rates, while simultaneously tracking real-time individual positions of roughly 100,000 particles by confocal microscopy. We probe the elastic, anelastic, and plastic responses of the system to applied strain, with particular focus on identifying the local mechanisms of deformation. In plastic deformation, we observe thermally activated rearrangements of groups of particles, the nature and concentration of which are correlated with local parameters such as strain, Voronoi volume, and free volume.

Katharine Jensen  
Harvard University Department of Physics

Date submitted: 19 Nov 2010

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