Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Structural response of a colloidal glass to local forcing[1] KEVIN B. APTOWICZ, West Chester University, PETER J. YUNKER, University of Pennsylvania, SEAN GOSSIN, West Chester University, ZEXIN ZHANG, A. G. YODH, University of Pennsylvania — Video microscopy of glassy colloidal suspensions permits direct visualization of particle locations and trajectories, thereby providing an excellent experimental tool to aid our understanding of glasses and address current theories. We have conducted a series of experiments utilizing a bidisperse mixture of thermosensitive NIPA microgel spheres to study the structural response of a two-dimensional colloidal glass to point expansion. The packing fraction of the colloidal suspension is tuned from a liquid to a deeply jammed glass by varying the global temperature of the sample. Over this range of packing fractions, the response of the sample to point expansion is analyzed. In particular, an infrared laser tightly focused on the sample generates thermophoretic forces that lead to a point expansion in the colloidal glass. We track particle rearrangements and characterize the response as a function of packing fraction. These experiments take a step towards understanding the relationship between local structure and bulk properties of glass.

[1]This research is supported by MRSEC grant DMR-0520020 (AGY), NSF grant DMR-080488 (AGY) and an award from Research Corporation (KBA).

Kevin B. Aptowicz
West Chester University

Date submitted: 21 Nov 2008 Electronic form version 1.4