Abstract Submitted
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Rotational and Translational Diffusion Near the Colloidal Glass Transition[1] KAZEM V. EDMOND, Emory University, MARK T. ELSESSER, New York University, GARY L. HUNTER, Emory University, DAVID J. PINE, New York University, ERIC R. WEEKS, Emory University — We study concentrated colloidal suspensions, a model system which has a glass transition. Using confocal microscopy we observe the three-dimensional translational and rotational motion of rigid clusters of particles suspended in a dense colloidal suspension of spheres. The clusters are highly ordered packings of fluorescently-labeled, core-shell PMMA particles, fabricated using a variation of a previously developed emulsification technique [1]. We use the dense suspension of spheres as the supercooled glass-forming liquid, while the clusters serve as tracers possessing rotational and translational dynamics. With image analysis and particle tracking software, we track both the translational and rotational motion of the tracer clusters in three dimensions. Far from the glass transition, both types of motion are purely Brownian in character. In contrast, near the glass transition, we observe both types of motion become temporally intermittent.

[1] V. N. Manoharan, M. T. Elsesser, and D. J. Pine, "Dense Packing and Symmetry in Small Clusters of Microspheres" Science 301, 483 (2003)

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