

Abstract Submitted  
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**Nonlinear behavior of a driven probe in a colloidal suspension near the Glass Transition.** JASON HAY, Emory University, PIOTR HABDAS, St. Joseph's University, ERIC R. WEEKS, Emory University — By applying a force to isolated microscopic magnetic particles embedded in a PMMA colloidal suspension a nonlinear relationship between the applied force and the measured velocity was measured with the assistance of a confocal microscope. Over short time scales it is possible to observe a threshold force, below which no apparent motion is detected. The value of this threshold force is highly dependent upon the concentration of the sample. At stronger forces, the velocity of a driven magnetic particle displays a power law dependence upon the applied force. In particular, the behavior becomes increasingly nonlinear as the concentration is raised toward the colloidal glass transition point. This behavior was consistent across numerous samples with different concentrations and a varying size ratio of PMMA to magnetic particle.

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