Abstract Submitted for the MAR12 Meeting of The American Physical Society

Particle dynamics in colloidal glasses with short-range attraction<sup>1</sup> PIOTR HABDAS, Department of Physics, Saint Joseph's University, KE CHEN, Department of Physics & Astronomy, University of Pennsylvania, MARTIN IWAN-ICKI, DANIEL FLYNN, JOHN MICHAEL DEVANY, LISA MARIANI, Department of Physics, Saint Joseph's University, ARJUN G. YODH, Department of Physics & Astronomy, University of Pennsylvania — We study colloidal particle dynamics of a model glass system using confocal microscopy as the sample evolves from a repulsive glass towards an attractive glass. Short-range depletion forces induce the transition from a repulsive glass to the attractive glass. We identify particles which exhibit substantial motional events and characterize the transition using the properties of these motional events. It appears that number of particles that exhibit motional events doesn't change as the system is brought from a repulsive glass towards the attractive glass. Also, we investigate vibrational properties of these dense colloidal suspensions. Our preliminary results show that the boson peak for an attractive glass is lower than that for a repulsive system and it is shifted towards higher frequencies. To our knowledge, this is the first experimental investigation of the evolution of vibrational modes in colloidal glasses when particle interaction potential changes from repulsive to attractive.

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