Abstract Submitted
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Particle dynamics and vibrational properties of disordered colloidal packings with varying interparticle attraction strength[1] PIOTR HABDAS, Department of Physics, Saint Joseph's University, MATTHEW GRATALE, ZOEY DAVIDSON, TIM STILL, ARJUN G. YODH, Department of Physics and Astronomy, University of Pennsylvania — We experimentally study dynamical and vibrational properties of disordered colloidal packings as a function of the strength of the interparticle attraction. Specifically, we probe the structural and dynamical changes in disordered colloidal glasses as the interparticle interaction between constituent particles evolves from nearly hard-sphere repulsive to attractive. This increase of the interparticle attraction is achieved through use of temperature-tunable surfactant micelle depletants. The depletion-driven entropic attraction between particles in suspension grows with increasing temperature. Increasing temperature changes particle interactions in a dense colloidal packing from repulsive (weakly attractive) to strongly attractive, and accompanying variations in structure and dynamics is investigated. Preliminary experiments on these disordered systems show a continuous change in particle dynamics as attraction strength increases. Interestingly, vibrational properties show a more sudden change reflected in the behavior of the vibrational density of states.

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