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Vibrational properties of dense colloidal suspensions with short-range interparticle attraction[1] MARTIN IWANICKI, Department of Physics, Saint Joseph's University, KE CHEN, Institute of Physics, Chinese Academy of Sciences, ARJUN G. YODH, Department of Physics and Astronomy, University of Pennsylvania, PIOTR HABDAS, Department of Physics, Saint Joseph's University
— We investigate vibrational properties of dense colloidal suspensions with short-range attractive particle interactions. Preliminary results show that the so-called boson peak in the attractive glass density of states is weaker than in comparable repulsively-interacting disordered suspensions. Interestingly, the position of the peak shifts to higher frequencies with increasing interparticle attraction strength. The participation ratio, which measures the degree of spatial localization, also shifts to higher frequencies with increasing interparticle attraction. Interestingly, characteristics of quasi-localized modes do not seem to depend on the attraction strength between particles. The observations are consistent with studies in hard-sphere colloidal suspensions where the boson peak frequency decreased with increasing volume fraction, and was understood in the jamming framework.

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Piotr Habdas
Department of Physics, Saint Joseph's University

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