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Elastic Excitations in Colloidal Crystals Confined in an Emulsion Droplet N.L. GREEN, Department of Chemical Engineering, MARGAUX GUICHE, Department of Materials Science & Engineering, C.E. MALONEY, Department of Civil & Environmental Engineering, M.F. ISLAM, Department of Chemical Engineering and Department of Materials Science & Engineering, Carnegie Mellon University, Pittsburgh, PA 15213 — We confine colloidal crystals in emulsion droplets and study the lattice dynamics using video microscopy. The colloids are temperature-sensitive spherical microgels; the diameter of the microgel particles and hence the volume fraction of the crystal can be changed by tuning the temperature. We measure the vibrational modes in this system as a function of volume fraction and degree of confinement. Finally, we compare our measurements to simulations on vibrational modes in crystal drops. This work has been partially supported by the NSF through Grants DMR-0619424 and DMR-0645596, by ACS-PRF, and by the Alfred P. Sloan foundation.

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