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Microrheology of FCC Hard Sphere Crystals M.T. SULLIVAN, K. ZHAO, A.D. HOLLINGSWORTH, W.B. RUSSEL, P.M. CHAIKIN, Princeton University, A.J. LEVINE, University of Massachusetts, Amherst — We present a measurement of the low-frequency elastic moduli of hard sphere colloidal crystals. Our system consists of concentrated suspensions ($\phi > 0.49$) of monodisperse PMMA-PHSA particles suspended in a density-matching solvent mixture of decalin and tetrachloroethylene. Single crystals are heterogeneously nucleated from a templated surface. In particular, a square surface pattern is used to grow large (1mmx1mm laterally, 20 microns deep), face centered cubic (FCC) single crystals from the template surface. Using confocal microscopy and video analysis techniques, we have measured the thermally driven self- and cross- correlated particle motion in the (100) plane. The measured viscous and elastic responses show an angular dependence that is related to the anisotropy of the hard sphere FCC crystal.

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