Abstract Submitted
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Hydrodynamic damping of dense colloidal packings under confinement[1] MICHAEL RYAN, West Chester University, TIM STILL, University of Pennsylvania, MATTHEW WAITE, West Chester University, ARJUN YODH, University of Pennsylvania, KEVIN APTOWICZ, West Chester University — We experimentally study hydrodynamic damping of collective motion in dense colloidal crystals confined in a 1 micrometer channel. Particle diameters are on the order of the channel width resulting in quasi-two-dimensional entropic crystals. The packing fraction of the crystals, formed from soft thermo-responsive spheres, is varied with temperature. Digital video-microscopy is utilized to explore the phonon dynamics of the colloidal crystals. Friction coefficients along high symmetry directions in q-space are extracted and provide insight about the hydrodynamic forces at play. As expected, damping of collective motion increases with increasing packing fraction. Preliminary results suggest the friction coefficient decreases with increasing phonon wavelength, but it does not appear to vanish.

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Kevin Aptowicz
West Chester University

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