

Abstract Submitted
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Melting Dynamics of 3D Hard Sphere Colloidal Crystals DENIZ KAYA, N. L. GREEN, Chemical Engineering Department, C. E. MALONEY, Civil and Environmental Engineering Department, M. WIDOM, Physics Department, M. F. ISLAM, Chemical Engineering, Material Science and Engineering Department, Carnegie Mellon University, Pittsburgh, PA 15213 — We use thermally responsive monodisperse micron sized colloidal particles with hard-sphere interactions to study the melting mechanisms in colloidal crystals. As we increase the temperature, these spherical microgel particles decrease in volume, inducing melting in the colloidal crystals. We use video microscopy and image analysis to determine the dispersion relations and the local elasticity near the melting transition. We compare our findings with existing melting and freezing theories. This work has been partially supported by the NSF through Grants DMR-0619424 and DMR-0645596, and by ACS-PRF.

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