

Abstract Submitted
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Melting of 2D Colloidal Crystals J.R. SAVAGE, A.D. DINSMORE,
Department of Physics, Umass, Amherst — We study the kinetics of melting of colloidal crystals formed by a short-range attractive potential. We use aqueous suspensions of micron-sized latex spheres mixed with surfactant (SDS) micelles, which create a depletion attraction among the spheres. Single-layer crystals appear on the glass surface. Upon uniformly heating the sample to 60 deg., the micelles shrink. The depletion attraction weakens by a factor of approximately 2.25, and the crystals melt. Optical microscopy is used to track the motions of hundreds of colloidal spheres for up to 2 hours, until crystals have melted. We initially observe a steady decrease in the size of the crystallites, limited by diffusion. When the size reaches approximately 15, however, crystallites rapidly shrink. The kinetics of individual bond-breaking events and the evolution of the crystalline order parameter will be presented. This work is supported by the Research Corporation and by NSF-DMR 0305395.

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