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Melting Dynamics of Colloidal Thin Films on Patterned Substrates JOHN MERGO, School of Applied and Engineering Physics, Cornell University, JOHN SAVAGE, Department of Physics, Cornell University, ITAI COHEN, Deparment of Physics, Cornell University — We present results of experiments on the melting dynamics of colloidal crystals formed on patterned substrates. Our system consists of micron-sized colloidal particles and a tunable short- range attractive depletion interaction that can be controlled by small temperature changes. We investigate the melting rates of crystalline islands that form on substrates with square and hexagonal symmetry. We find that crystals with square symmetry melt significantly slower than those with hexagonal symmetry despite the fact that particles at the edge of the hexagonal crystal are on average bound more strongly than those at the edge of a square crystal. We find that the symmetry of the substrate affects the ability of particles to diffuse away from a melting crystal, and these differences in single-particle diffusion rates account for the difference in melting rates.

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