

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Melting of Colloidal-Crystal Films YI PENG, ZIREN WANG, Hong Kong University of Science and Technology, AHMED ALSAYED, ARJUN YODH, University of Pennsylvania, YILONG HAN, Hong Kong University of Science and Technology — We studied the melting of multilayer colloidal crystals composed of diameter tunable microgel spheres with short-ranged repulsive interactions confined between two glass walls. Samples are annealed into large crystalline domains so that the finite size effects are negligible. Different melting behaviors were observed in three thickness regimes: 1. Thick films (> 4 -layer) melt from grain boundaries in polycrystals and from surfaces in single crystals. The liquid-solid coexistence regime decreases with the thickness and vanishes at 4 layers. 2. Thin films (2 to 4-layer) melt homogenously from both grain boundaries and surfaces. One-step melting is observed in 2-, 3- and 4-layer triangular and square lattices. 3. Monolayers melt in two steps with a middle hexatic phase.

Yi Peng
Hong Kong University of Science and Technology

Date submitted: 01 Dec 2009

Electronic form version 1.4