Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Grain Boundary Roughening in Colloidal Crystals[1] YILONG HAN, MAIJIA LIAO, XIAO XIAO, Hong Kong University of Science and Technology, TOM LUBENSKY, University of Pennsylvania — We studied the grain-boundary roughening transition inside the bulk of thermal-sensitive thin-film colloidal crystals by video microscopy and phase-field simulations. As the volume fraction of the microgel colloidal polycrystals decrease, we observed that the large-angle grain boundaries become rough with the strongest shape fluctuations at the roughening transition point below the premelting point. The roughening transition exhibits critical behaviors. We discovered the structural change responsible to the exotic decrease of the shape fluctuation and the mobility change of the grain boundary as approaching the premelting point. Small-angle grain boundaries do not have the roughening transition and exhibit different melting behaviors.

[1]The project was supported by GRF grants 601911 and 16301514.

Yilong Han
Hong Kong University of Science and Technology

Date submitted: 20 Oct 2014 Electronic form version 1.4