Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Improved Measurements of the Dominant Mode Wavelength in Viscous Nanofilms Undergoing 3D Pillar Growth Via Bénard Type Instability[1] SANDRA TROIAN, KEVIN FIEDLER, California Institute of Technology, MC 128-95, Pasadena, CA 91125 — Free surface viscous nanofilms exposed to an initial uniform and very large transverse thermal gradient are prone to spontaneous formation and growth of nanopillars typically separated by tens of microns or less. Linear stability analyses of various interface equations in the long wavelength limit suggest these formations can result either from fluctuations in electrostatic forces between the fluid interface and induced image charge distribution,[2] radiation pressure induced by acoustic phonon reflections,[3] or thermocapillary stresses leading to Bénard-like deformations.[4] Here we review improvements over previous comparison to theoretical predictions[5] which suggest even closer agreement with the thermocapillary model; however, systematic discrepancies persist. We have therefore redesigned our experimental system for more accurate thermal flux control and estimation and will discuss our newest results.

[1]Financial support from a 2013 NASA Space Technology Research Fellowship is gratefully acknowledged.
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Date submitted: 31 Jul 2014 Electronic form version 1.4