Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Interface evolution and cluster formation during de-wetting of thin solid films ADI CONSTANTINESCU, LEONARDO GOLUBOVIC, West Virginia University, ARTEM LEVANDOVSKY, University of California Riverside — Morphology evolution of solid thin films is investigated within a continuum interface dynamics model that incorporates both the interface relaxation and the long range de-wetting interactions. The model is used to explore the cluster formation phenomena seen on the surfaces of polymeric and metallic thin films. Via numerical simulations and analytic arguments, we obtain the scaling laws governing the coarsening growth of these clusters. These scaling laws are found to be super-universal at long time scales: They do not depend on the dimensionality of the film substrate and the nature of the long range de-wetting interactions, as documented by our numerical simulations on 1-d and 2-d substrates with de-wetting interactions of various forms. However, for the physically interesting 2-d substrates, the long range interactions introduce a distinct early time scaling behavior that persists over many decades of time and may be significant for the understanding of the current experimental phenomenology.

Adi Constantinescu
West Virginia University

Date submitted: 20 Nov 2008 Electronic form version 1.4