Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Approach to universal self-similar attractor for the levelling of thin liquid films ELIE RAPHAEL, MICHAEL BENZAQUEN, UMR CNRS 7083 Gulliver, ESPCI ParisTech, PSL Research University, PAUL FOWLER, Department of Physics and Astronomy and the Brockhouse Institute for Materials Research, McMaster University, Hamilton, Canada, LAETITIA JUBIN, Department of Physics & Astronomy and the Brockhouse Institute for Materials Research, McMaster University, Hamilton, Canada, THOMAS SALEZ, UMR CNRS 7083 Gulliver, ESPCI ParisTech, PSL Research University, KARI DALNOKI-VERESS, Department of Physics and Astronomy and the Brockhouse Institute for Materials Research, McMaster University, Hamilton, Canada — We compare the capillary levelling of a random surface perturbation on a thin polystyrene film with a theoretical study on the two-dimensional capillary-driven thin film equation. Using atomic force microscopy, we follow the time evolution of samples prepared with different initial perturbations of the free surface. In particular, we show that the surface profiles present long term self-similarity, and furthermore, that they converge to a universal self-similar attractor that only depends on the volume of the perturbation, consistent with the theory. Finally, we look at the convergence time for the different samples and find very good agreement with the analytical predictions.

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Date submitted: 07 Nov 2014 Electronic form version 1.4