Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Controlling surface morphologies by time-delayed feedback[1]
BEATE SCHMITTMANN, Virginia Tech, MICHAEL BLOCK, ECKEHARD SCHOELL, Technische Universitaet Berlin — We propose a new method to control the roughness of a growing surface, via a time-delayed feedback scheme. The method is very general and can be applied to a wide range of non-equilibrium growth phenomena, from solid-state epitaxy to tumor growth. Possible experimental realizations are suggested. As an illustration, we consider the Kardar-Parisi-Zhang equation in 1+1 dimensions and show that the effective growth exponent of the surface width can be stabilized at any desired value in the interval [0.25,0.33], for a significant length of time.

[1]We acknowledge partial support from the NSF through DMR 0414122 and the DPG through SFB 296.

Beate Schmittmann
Virginia Tech

Date submitted: 30 Nov 2007 Electronic form version 1.4