Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Modeling Nanoscale Dynamics for Film Growth ALEXANDRA TEN BOSCH, CNRS, Lab.Phys. Mat. Cond., Parc Valrose, 06108 Nice, France — Small scale particle motion controls the onset of a phase transition. A general method is developed which links atomic and mesoscopic dynamics in a nanoscale description reminiscent of the classical theory of fluid flow. Derived from a Fokker Planck equation for the non-equilibrium particle distribution, the dynamic equation includes inertia terms essential for high frequency fluctuations. Film nucleation and growth are modeled by the spatially inhomogeneous evolution of the instantaneous density profile which measures the average number of particles at a given time and position. The method is used to show how an alteration in the equilibrium distribution of particles at the boundary between parent and product phases induces transient film growth and/or damped vibrations at the surface. To illustrate, condensation of a simple fluid on a surface is considered.

Alexandra ten Bosch
CNRS, Lab.Phys. Mat. Cond., Parc Valrose, 06108 Nice, France

Date submitted: 25 Nov 2005 Electronic form version 1.4