Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Instabilities of structured metal films on nanoscale[1] NANYI DONG, NJIT, YUEYING WU, U. Tennessee, JASON FOWLKES, ORNL, PHILIP RACK, U. Tennessee, LOU KONDIC, NJIT — We consider instabilities of metal films on nanoscale, with particular focus on the interplay between the initial geometry and instability development. In experiments, metal films are deposited lithographically, allowing for precise control of the initial shape, and then exposed to laser pulses that liquefy them. The considered geometries involve various shapes (cylinders or prisms) superimposed on top of a flat film. We consider this problem within the framework of the long wave (lubrication) theory. Our simulations show that the main features of the instability development could be captured, as long as destabilizing liquid-solid interaction is considered in the model. We conclude by discussing the influence of the distance between the imposed perturbations, their shape, as well as experimental noise on the evolution.

[1]Supported by NSF Grant No. CBET-1235710

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Date submitted: 31 Jul 2014 Electronic form version 1.4