

Abstract Submitted  
for the DPP05 Meeting of  
The American Physical Society

**Modeling of Nike Experiments on Acceleration of Planar Targets Stabilized with a Short Spike**<sup>1</sup> N. METZLER, SAIC and Physics Department, NRCN, Israel, A.L. VELIKOVICH, J. WEAVER, A.J. SCHMITT, D.G. COLOMBANT, S.T. ZALESK, Plasma Physics Division, Naval Research Laboratory, J.H. GARDNER, LCP&FD, Naval Research Laboratory — A short sub-ns laser pulse (spike) produces a decelerating shock wave and a rarefaction wave immediately behind it, shaping a density gradient in the target. The following main pulse “rides” this graded density profile. We have demonstrated how the deceleration of the ablation front following the shock wave suppresses laser imprint and delays perturbation growth in the target [1]. We report the results of 2D numerical modeling of experiments on Nike laser at NRL, with its recently developed short-pulse capability, for a low-energy spike which does not affect the target adiabat. We studied the effect of spike on laser imprint on smooth planar targets and on the growth of perturbations imposed as single-mode ripples on the irradiated surface of the targets. For all cases, delay of the onset and/or suppression of the rate of the mass perturbation growth due to the spike are robust and significant enough to be observable on Nike. [1] N. Metzler *et al.*, Phys. Plasmas **6**, 3283 (1999); **9**, 5050 (2002); **10**, 1897 (2003).

<sup>1</sup>Work supported by the U.S. Department of Energy.

Alexander Velikovich  
Plasma Physics Division, Naval Research Laboratory

Date submitted: 24 Jul 2005

Electronic form version 1.4