Abstract Submitted
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Nike Experiment to Observe Strong Areal Mass Oscillations in a Rippled Target Hit by a Short Laser Pulse[1] Y. AGLITSKIY, SAIC, M. KARASIK, A.L. VELIKOVICH, V. SERLIN, J.L. WEAVER, T.J. KESSLER, A.J. SCHMITT, S.P. OBENSCHAIN, Plasma Physics Division, NRL, N. METZLER, Artep, Inc., J. OH, RSI — When a short (sub-ns) laser pulse deposits finite energy in a target, the shock wave launched into it is immediately followed by a rarefaction wave. If the irradiated surface is rippled, theory and simulations predict strong oscillations of the areal mass perturbation amplitude in the target [A. L. Velikovich *et al.*, Phys. Plasmas **10**, 3270 (2003).] The first experiment designed to observe this effect has become possible by adding short-driving-pulse capability to the Nike laser, and has been scheduled for the fall of 2010. Simulations show that while the driving pulse of 0.3 ns is on, the areal mass perturbation amplitude grows by a factor $\sim$2 due to ablative Richtmyer-Meshkov instability. It then decreases, reverses phase, and reaches another maximum, also about twice its initial value, shortly after the shock breakout at the rear target surface. This signature behavior is observable with the monochromatic x-ray imaging diagnostics fielded on Nike.

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