Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Optical and opto-electronic based velocity and topographic measurements of a laser-ablated thin-metal layer on glass ANTHONY VALENZUELA, GEORGE RODRIGUEZ, Materials Physics and Applications Div., Los Alamos National Laboratory, STEVEN CLARKE, KEITH THOMAS, Weapons System Engineering Div., Los Alamos National Laboratory — We report on our ability to resolve the velocity and spatial profile of ablatively launched metal with nano-scale precision. We utilize a nanosecond laser pulse to launch a thin layer of titanium metal from a glass surface. Subsequently, we use optical and opto-electronic devices to diagnose the velocity and topography of the launched metal. Our Photonic Doppler Velocimeter (PDV) utilizes the heterodyne principle that allows us to track multiple velocity components. Our topographer incorporates a Shack-Hartmann interferometer to provide details of the deformation of the surface as it is launched. We compare the experimental data to simulations to provide a feedback loop to improve our theoretical models. We also discuss possibilities to extend the sensitivity of the PDV system to provide a compact diagnostic with a broad range of capabilities.

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Date submitted: 20 Nov 2006 Electronic form version 1.4