Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Laser imprint mitigation experiments measuring velocity fluctuations on shocks driven by the Nike KrF laser[1] JAECHUL OH, ANDREW J. SCHMITT, MAX KARASIK, STEPHEN P. OBENSCHAIN, Plasma Physics Division, U.S. Naval Research Laboratory — We present results of laser imprint mitigation experiments measuring shock velocity modulations induced by illumination nonuniformities of the Nike laser. 2-dimensional spatial profiles of the shock velocity fluctuations were directly measured by the high resolution 2D VISAR.[a,b] Planar CH targets with and without a thin high-Z (400A Au or 600A Pd) overcoat were irradiated by four, eight, and sixteen Nike beams overlapped to explore the imprint reduction. The uncoated target experiment confirmed that the velocity perturbations decreased with an increasing number of laser beams, precisely as anticipated by the beam averaging effect on laser imprint. The coated experiment observed the shock velocity fluctuations were significantly suppressed by a factor of 3–6, compared to their counterparts in the uncoated experiment. The experimental results are being compared with 3D radiation-hydrodynamics simulations of laser imprint. [a] P.M. Celliers, et al., Rev. Sci. Instrum. 81, 035101 (2010). [b] J. Oh, et al., Bull. Am. Phys. Soc., 6(11), GP11.119 (2018).

[1]Work supported by DoE/NNSA and performed at Naval Research Laboratory.

Jaechul Oh
Plasma Physics Division, U.S. Naval Research Laboratory

Date submitted: 29 Jun 2020 Electronic form version 1.4