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Emission spectra and velocimetry of soft x-ray driven shocks in high-Z coated foils on Omega EP[1] MAX KARASIK, J. WEAVER, J. OH, A. J. SCHMITT, S. P. OBENSCHAIN, Plasma Physics Division, US Naval Research Laboratory, D. N. POLSIN, D. MASTROSIMONE, Laboratory for Laser Energetics, University of Rochester — Laser imprint mitigation using high-Z coating has been shown to have an order-of-magnitude reduction in the laser non-uniformity seeding of hydrodynamic instabilities [Obenschain, PoP 9, 2234 (2002); M. Karasik, to be published]. A thin ($\sim 400\mathring{A}$) Pd or Au coating on the front of the ablator, pre-expanded to 100um provides an initial smooth soft x-ray drive, subsequently transitioning to efficient direct drive. Experiments on this hybrid indirect-direct drive have thus far been conducted with plastic ablator thicknesses comparable to that on ignition-scale capsules. Thinner ablators, such as 8um used in cryogenic implosions on OMEGA, may be more susceptible to the effects of x-ray preheat from the coating. In order to quantify the x-ray emission from the coating, NRL has installed an absolutely calibrated time-resolved soft x-ray transmission grating spectrometer on Omega EP similar to that [Weaver, PoP 8, 5230 (2001)] utilized on the Nike laser at NRL. The spectra show increased initial soft x-ray emission from the high-Z coating at the start of the laser pulse, followed by decay to the level of uncoated CH, as expected. The experiments also utilize VISAR to measure the speed of the shock in the ablator to be used for benchmarking shock timing with the high-Z coated targets.

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