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LPI Experiments at the Nike Laser* J. WEAVER, NRL, J. OH, RSI, B. AFEYAN, Polymath Res., L. PHILLIPS, J. SEELY, C. BROWN, M. KARASIK, V. SERLIN, S. OBENSCHAIN, L.-Y. CHAN, D. KEHNE, D. BROWN, A. SCHMITT, A. VELIKOVICH, NRL, U. FELDMAN, ARTEP, G. HOLLAND, SFA, Y. AGLITSKIY, SAIC — Advanced implosion designs under development at NRL for direct drive inertial confinement fusion incorporate high intensity pulses from a krypton-fluoride (KrF) laser to achieve significant gain with lower total laser energy (E_{tot} ~500 kJ). These designs will be affected by the thresholds and magnitudes of laser plasma instabilities (LPI). The Nike laser can create short, high intensity pulses (t <0.4 ns; I>10^{15} W/cm^2) to explore how LPI will be influenced by the deep UV (248 nm), broad bandwidth (2-3 THz), and induced spatial incoherence beam smoothing of the NRL KrF laser systems. Previous results demonstrated no visible/VUV signatures of two-plasmon decay ($2\omega_p$) for overlapped intensities ~2x10^{15} W/cm^2. We have increased the laser intensity and expanded the range of targets and diagnostics. Single and double pulse experiments are being planned with solid, foam, and cryogenic targets. In addition to spectrometers to study SRS, $2\omega_p$, SBS, and the parametric decay instability, hard x-ray spectrometers (hν >2 keV) and a scintillator/photomultiplier array (hν >10 keV) have been deployed to examine hot electron generation. *Work supported by U. S. DoE.

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