Abstract Submitted
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Long Scale-length Plasmas for Studies of LPI Mitigation Via Laser Bandwidth[1] J. WEAVER, J. OH, D. KEHNE, A. J. SCHMITT, J. BATES, S. OBENSCHAIN, NRL, R. LEHMBERG, RSI, R. FOLLETT, LLE/UR, J. WILLIAMS, GA, F. TSUNG, UCLA — Experiments at the Nike laser are investigating mitigation of laser plasma instabilities (LPI) via increased laser bandwidth under conditions relevant for inertial confinement fusion. A key step is the creation of a reproducible plasma with long scale-lengths. A previous LPI campaign used a single type of low density foam target to produce large volume plasmas with estimated 5-10x longer density and velocity scale-lengths than solid CH targets. The current study explores a wider range of initial foam densities and utilizes exploding foil targets for comparison to LPI experiments from longer wavelength laser systems. Once the plasma is established and LPI generated, the output spectrum for the Nike laser (λ_{peak} =248.5 nm) can be broadened by etalons in the front end or by stimulated rotational Raman scattering after the final amplifier.[Weaver, App. Optics (2017)] The current campaign also uses a 5^{th} harmonic probe laser (213 nm) to determine the electron density profile around the time of peak pump intensity via a grid image refractometry (GIR) diagnostic.[Oh, Rev. Sci. Instru. (2015)] This poster will present the results from this campaign and simulations (FASTrad3D [Gardner, Phys. Plasmas (1998)] and LPSE [Myatt, Phys. Plasmas (2017)]) performed to evaluate LPI growth in these plasmas.

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James Weaver
United States Naval Research Laboratory

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