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Bandwidth Dependence of Laser Plasma Instabilities Driven by the Nike KrF Laser[1] J.L. WEAVER, NRL, J. OH, RSI, J. SEELY, D. KEHNE, C.M. BROWN, S. OBENSCHAIN, V. SERLIN, A.J. SCHMITT, L. PHILLIPS, NRL, R.H. LEHMBERG, E. MCLEAN, C. MANKA, RSI, U. FELDMAN, Artep — The Nike krypton-fluoride (KrF) laser at the Naval Research Laboratory operates in the deep UV (248 nm) and employs beam smoothing by induced spatial incoherence (ISI). In the first ISI studies at longer wavelengths (1054 nm and 527 nm) [Obenschain, PRL **62**, 768(1989);Mostovych, PRL, **59**, 1193(1987);Peyser, Phys. Fluids B **3**, 1479(1991)], stimulated Raman scattering, stimulated Brillouin scattering, and the two plasmon decay instability were reduced when wide bandwidth ISI ($\delta\nu/\nu$ ~0.03-0.19%) pulses irradiated targets at moderate to high intensities (10^{14}-10^{15}W/cm^2). Recent Nike work showed that the threshold for quarter critical instabilities increased with the expected wavelength scaling, without accounting for the large bandwidth ($\delta\nu$ ~1-3 THz). New experiments will compare laser plasma instabilities (LPI) driven by narrower bandwidth pulses to those observed with the standard operation. The bandwidth of KrF lasers can be reduced by adding narrow filters (etalons or gratings) in the initial stages of the laser. This talk will discuss the method used to narrow the output spectrum of Nike, the laser performance for this new operating mode, and target observations of LPI in planar CH targets.

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