

Abstract Submitted  
for the DPP09 Meeting of  
The American Physical Society

**Laser Plasma Instability (LPI) Driven Light Scattering Measurements with 44 beam-lines of Nike KrF Laser\*** J. OH, Research Support Instruments, J.L. WEAVER, D.M. KEHNE, L.S. PHILLIPS, S.P. OBENSCHAIN, V. SERLIN, Naval Research Laboratory, E.A. MCLEAN, R.H. LEHMBERG, C.K. MANKA, Research Support Instruments — With short wavelength (248 nm), large bandwidth ( $\sim 1 THz$ ), and ISI beam smoothing, Nike KrF laser provides unique opportunities of LPI research for direct-drive inertial confinement fusion. Previous experiments at intensities ( $10^{15} \sim 10^{16} W/cm^2$ ) exceeded two-plasmon decay (TPD) instability threshold using 12 beam-lines of Nike laser.<sup>a,b</sup> For further experiments to study LPI excitation in bigger plasma volumes, 44 Nike main beams have been used to produce plasmas with total laser energies up to 1 kJ of  $\sim 350$  psec FWHM pulses. This talk will present results of the recent LPI experiment focusing on light emission data in spectral ranges relevant to the Raman (SRS) and TPD instabilities. The primary diagnostics were time-resolved spectrometers with an absolute-intensity-calibrated photodiode array in  $(0.4 \sim 0.8)\omega_0$  and a streak camera near  $0.5\omega_0$ . Blackbody temperature and expansion speed measurements of the plasmas were also made. The experiment was conducted at laser intensities of  $(1 \sim 4) \times 10^{15} W/cm^2$  on solid planar CH targets. <sup>a</sup> J. L. Weaver, et al, NO4.14, APS DPP (2008) <sup>b</sup> J. Oh, et al, NO4.15, APS DPP (2008) \* Work supported by DoE/NNSA and performed at Naval Research Laboratory.

J. Oh  
Research Support Instruments

Date submitted: 17 Jul 2009

Electronic form version 1.4