Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Ultraviolet Thomson Scattering from Two-Plasmon–Decay Driven Electron Plasma Waves at Quarter-Critical Densities R.K. FOLLETT, D.T. MICHEL, S.X. HU, J.F. MYATT, R.J. HENCHEN, J. KATZ, D.H. FROULA, Laboratory for Laser Energetics, U. of Rochester — Thomson scattering (TS) was used to probe electron plasma waves (EPW's) driven by the two-plasmon–decay (TPD) instability near quarter-critical density. TPD-driven EPW's were observed at densities consistent with the common-wave TPD model. Five laser beams ($\lambda_{3\omega} = 351\,\text{nm}$)produced 400-$\mu$m-diam (FWHM) laser spots with overlapped intensities up to 3×10^{14} W/cm^2. A 263-nm TS beam was used to probe densities ranging from 0.18 to 0.26 n_c, where n_c is the critical density for 351-nm light. The experimental geometry was chosen to match the five-beam TPD common wave k vector. The TS spectrum shows a large amplitude, narrow (∼1.6-nm FHWM) feature centered around 423.4 nm. This wavelength corresponds to scattering from EPW's with a normalized wave vector $k/k_{3\omega} = 1.3$, a density of $n_\text{e}/n_\text{c} = 0.243$, and a temperature of $T_\text{e} = 2$ keV. This is consistent with the predicted values given by the dispersion relations and TPD maximum growth hyperbola. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

R.K. Follett
Laboratory for Laser Energetics, U. of Rochester

Date submitted: 12 Jul 2013 Electronic form version 1.4