Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Laser Wakefield Acceleration Experiments in the Self Modulated Regime at Titan PAUL KING, University of Texas at Austin, FELICIE ALBERT, NUNO LEMOS, SIDDARTH PATANKAR, JOSEPH RALPH, Lawrence Livermore National Laboratory, JESSICA SHAW, UCLA, MANUEL HEGELICH, University of Texas at Austin, JOHN MOODY, Lawrence Livermore National Laboratory, CHAN JOSHI, UCLA — Picosecond laser plasma interaction has been studied as a novel source of producing betatron x-rays. In this regime, electrons are accelerated through the interplay of two mechanisms: self-modulated laser wakefield acceleration and direct laser acceleration. The experiment, conducted on the Titan laser system (1 ps and 150 Joules) at Lawrence Livermore National Lab, using electron densities of $0.5 - 1.5 \times 10^{19} cm^{-3}$, found electrons accelerated to energies of up to 250 MeV with divergence half angles on order of 10s of milliradians. Corresponding to the electron densities above, frequency shifts of laser light on order $\omega_p \sim 1.5 - 2 \times 10^{14}$ rad/sec were measured using Raman forward scattering diagnostics.

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Date submitted: 15 Jul 2016 Electronic form version 1.4