Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Investigating ultra-fast phenomena in laser-plasma interactions using DIXI (dilation x-ray imager) S.R. NAGEL, H. CHEN, M.E. FOORD, P.M. BELL, D.K. BRADLEY, A.U. HAZI, E.V. MARLEY, J. PARK, G.J. WILLIAMS, Lawrence Livermore National Laboratory, S.M. KERR, University of Alberta, T.J. HILSABECK, J.D. KILKENNY, General Atomics, A.K.L. DYMOKE-BRADSHAW, J.D. HARES, Kentech Instruments Ltd. — Time resolved x-ray images with 7 ps resolution were recorded on relativistic short-pulse laser-plasma experiments at the TITAN laser at LLNL. The data was recorded using the dilation x-ray imager (DIXI), a new high-speed x-ray framing camera sensitive to x-rays in the range of ∼1-17 keV. DIXI, a 2D imager, uses the pulse-dilation technique to achieve a temporal resolution down to 5 ps, otherwise only attainable with 1D-streaked imaging. Using titanium foils as targets and as buried layers in plastic targets, we measured the electron beam divergence and the effects of target back thickness and laser pre-pulse on the emission evolution through the time-resolved 2D images of the x-ray emission. This technique allows for the investigation of fast electron transport within the target with unprecedented temporal resolution. The data interpretation is supported by LSP simulations. Work supported by U.S. Department of Energy under Contract DE-AC52-06NA27279. LLNL-ABS-656682

Sabrina R. Nagel
Lawrence Livermore National Laboratory

Date submitted: 10 Jul 2014 Electronic form version 1.4