Abstract Submitted
for the APR08 Meeting of
The American Physical Society

**Transport of Energy by Ultra-Intense Laser-Generated Electrons in Nail-Wire Targets**[1] T. MA, J.A. KING, M.S. WEI, F.N. BEG, UCSD, K. AKLI, R.B. STEPHENS, General Atomics, S.P. HATCHETT, M.H. KEY, A.J. MACKINNON, A.G. MACPHEE, LLNL, R.R. FREEMAN, L. VAN WOERKOM, OSU, J.S. GREEN, K.L. LANCASTER, P.A. NORREYS, RAL, W. THEOBALD, U. of Rochester, R. MASON, Research Applications Corporation — Understanding the transport of energy by relativistic fast electrons produced in petawatt ($10^{15}$ W) laser matter interactions is one of the key challenges in fast ignition of ICF. A simple and small target (nail-wire) was designed to investigate aspects of this transport. Nail-wire targets were irradiated using the Vulcan Petawatt Laser (0.8 ps, 3x$10^{20}$ W/cm$^{-2}$) at the Rutherford Appleton Laboratory. A Cu K$\alpha$ spherically bent crystal imager, a Highly Ordered Pyrolytic Graphite (HOPG) Spectrometer, and Single Photon Counting CCD were employed to give absolute K$\alpha$ measurements. The penetration of hot electrons via the nail head into the bulk of the wire has been determined from the K$\alpha$ data. XUV images (68 and 256 eV) indicate heating of a thin surface layer of the targets. A comparison of experimental results with the PIC/hybrid simulations using both LSP and e-PLAS will be presented at the meeting.

[1]Work performed under the auspices of US Dept of Energy contracts DE-FG02-05ER54834, W-7405-Eng-48 No. DE-FC02-04ER54789.

Tammy Ma
University of California, San Diego

Date submitted: 13 Jan 2008 Electronic form version 1.4