

Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Measurements of Bremsstrahlung and K-shell Emission to Determine the Hot Electron Temperature and Conversion Efficiency in Short-pulse Laser Experiments¹ C.D. CHEN, Plasma Science Fusion Center, Massachusetts Institute of Technology, J.A. KING, F.N. BEG, Department of Mechanical and Aerospace Engineering, University of California-San Diego, A.G. MACPHEE, M.H. KEY, A.J. MACKINNON, Lawrence Livermore National Laboratory, L. VAN WOERKOM, College of Mathematical and Physical Sciences, Ohio State University — Understanding the conversion efficiency and temperature spectrum of relativistic electrons produced via laser-plasma interactions is an essential first step for determining the coupling of laser energy to the compressed core of a fast ignition target. Measurements of the Bremsstrahlung spectrum and k-shell yield were made using a differentially filtered imaging plate spectrometer and a single-hit CCD spectrometer on various foil and cone targets irradiated with the TITAN laser (1054 nm, 150 J, 10^{20} W/cm²) at Lawrence Livermore National Laboratory. The temperature and absolute number of relativistic electrons have been inferred from these x-ray measurements using the Monte Carlo code Integrated Tiger Series (ITS) 3.0.

¹This work was performed under the auspices of the U.S. Department of Energy by University of California, Lawrence Livermore National Laboratory under Contract W-7405-Eng-48.

C.D. Chen
Plasma Science Fusion Center, Massachusetts Institute of Technology

Date submitted: 21 Jul 2007

Electronic form version 1.4