Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Modeling of bright Fe K-shell emission from laser-irradiated targets and comparison to data[1] J.D. COLVIN, Lawrence Livermore National Lab, M.J. MAY, K.B. FOURNIER, M.A. BARRIOS, J. KANE, K. WIDMANN, R. PATTERSON, M. SCHNEIDER, LLNL, S.P. REGAN, LLE-UR — We used the "high-flux" model incorporated in a 2D radiation-hydrodynamics code to simulate the Fe K-shell emission from under-dense Fe plasmas created by laser-driven targets on both the Omega laser at the University of Rochester and the National Ignition Facility laser at LLNL. In the high-flux model, independently developed by Colvin et al. (Phys. Plasmas 17, 073111, 2010) and Rosen et al. (HEDP 7, 180, 2011), non-local electron thermal conduction is modeled in the Spitzer-Harm formulation with a large flux limiter, and ionization levels are computed in non-LTE with a Detailed Configuration Accounting atomic model specially constructed for the Fe K-shell. In this presentation we show the simulated emitted x-ray power vs time in several x-ray photon energy bands and the time-integrated emitted spectra, and compare these simulated results to the corresponding data from several actual Omega and NIF shots.

[1]This work was performed under the auspices of the U.S. Department of Energy by LLNL under Contract No. DE-AC52-07NA27344, with funding support from Defense Threat Reduction Agency IACRO No.11-4551.

J. D. Colvin
Lawrence Livermore National Lab

Date submitted: 12 Jul 2012 Electronic form version 1.4