Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Determining Spatial Dependence of Plasma Conditions in HEDP Experiments Based on Space-Resolved Spectral Data JOSEPH MACFARLANE, I. GOLOVKIN, P. WOODRUFF, Prism Computational Sciences, J. BAILEY, G. ROCHAU, Sandia National Laboratories — We discuss the analysis of space-resolved spectral data obtained in a series of Ar-doped DD capsule implosion experiments carried out at the Sandia Z Facility. The 1-D space-resolved Ar K-shell spectra obtained in these dynamic hohlraum experiments – which supply data for the spatial dependence of line intensities, line ratios, and line widths of the Ar He-like and H-like lines – provide valuable constraints on the variation of plasma conditions (e.g., electron density and temperature) in the imploded core. In our analysis, we use the SPECT3D Imaging and Spectral Analysis package to compute high-resolution space-resolved spectra for a variety of plasma distributions. In the present analysis, non-LTE atomic level populations and emergent spectra are computed for spherically symmetric plasma grids with temperature and density distributions specified by analytic functions. In particular, we study the sensitivity of the simulated space-resolved data (line widths, intensities, and ratios) to the variation in the density and temperature profiles.

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Date submitted: 14 Aug 2008 Electronic form version 1.4