

Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Diagnosing Plasma Conditions in Copper Wire Array Shots on Z: Spatially-Averaged Analysis Compared to Inferred Properties of Individual Bright Spots¹ J.P. APRUZESE, J.W. THORNHILL, A.L. VELIKOVICH, Naval Research Laboratory, B. JONES, D.J. AMPLEFORD, C.A. COVERDALE, Sandia National Laboratories — Recent copper wire array shots on Z, when spectroscopically analyzed on a spatially-averaged basis, appear to have achieved ion densities near 10^{21} cm⁻³, electron temperatures of 1.25 keV, and K-shell radiating participation of 70-85% of the load mass. However, pinhole images of the shots reveal considerable structure, including several well-defined intensely radiating “bright spots”, which may be due to enhanced density, temperature, or some combination of the two. We have analyzed these individual spots on selected shots, using line-outs of their spectrum and inferred powers based on their images. We compare the properties of these spots (are they dense, hot, or both?), and examine their effect on inferring the radiating mass.

¹Work supported by DOE/NNSA and SNL. Sandia is a multi-program laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy’s National Nuclear Security Administration under contract DE-AC04-94AL85000.

J. P. Apruzese
Naval Research Laboratory

Date submitted: 15 Jul 2010

Electronic form version 1.4