

L-SHELL SPECTROSCOPIC DIAGNOSTICS OF IMPLODING WIRE ARRAY PLASMAS*

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Intriguing time-gated, radially resolved L-shell line emission profiles have been observed from recent Cu/Ni wire array implosions on Sandia's Z facility. The well resolved measurements exhibit lineshapes that appear as hollow, asymmetric ovals whose variations in the intensity, spatial, and (Doppler-shifted) wavelength dimensions yield information on plasma densities, temperatures, gradients, dimensions, and velocities. We present an analysis of the measured L-shell emission using the accurate and flexible hybrid-structure collisional-radiative atomic model SCRAM and compare the diagnosed plasma conditions and modeled spectra with predictions and post-processed emission from the three-dimensional magneto-hydrodynamics code GORGON.

* 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.