

Abstract Submitted
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Spectroscopy of L-shell Cu ions¹ ARATI DASGUPTA, WARD THORNHILL, JOHN GIULIANI, JACK DAVIS, ROBERT CLARK, NRL, BRENT JONES, DAVE AMPLEFORD, STEPHANIE HANSEN, CHRIS JENNINGS, CHRISTINE COVERDALE, GREG ROCHAU, JAMES BAILEY, MIKE CUNEO, SNL — Radiation from Cu wire array Z pinches can have photon energies exceeding 8 keV. Experimental investigations of pinches on the Sandia National Laboratories Z machine using Cu arrays have already begun and more are planned for the near future. Diagnostics based on L-shell emissions are inherently more difficult than those for K-shell emissions, but they provide much more information about the L-shell experimental ionization dynamics and the extent to which a Z-pinch plasma approaches temperatures and densities required for significant K-shell x-ray production. We will analyze the ionization dynamics and generate K- and L-shell spectra for Cu using temperature and density conditions obtained from non-LTE radiation hydrodynamics simulations of experimental data. These results will be compared with K- and L-shell experimental spectra of Cu wire arrays imploded on the Sandia Z machine. Our self-consistent atomic model employs an extensive atomic level structure and data for all dominant atomic processes coupled with hydrodynamics and radiation transport to accurately model the spectroscopic details of the emitted radiation.

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