

Abstract Submitted
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Spectroscopic Analysis of K and L-shell emission with K- α lines for Cu¹ ARATI DASGUPTA, ROBERT CLARK, JOHN GIULIANI, JACK DAVIS, NRL, BRENT JONES, DAVE AMPLEFORD, SNL — Significant X-ray emissions from moderately high atomic number plasmas such as Cu accompany substantial K- α radiation. K-emission spectroscopy is a convenient means to diagnose high temperature plasmas, as K-shell vacancies occur due to inner-shell excitation and ionization by hot electrons and photoionization. For plasmas in collisional equilibrium, K- α emission occurs usually from highly charged ions due to the high electron temperatures required for appreciable excitation of the K- α transitions. Our investigation will focus on K- α flux generated primarily by impacting electrons in thermal distribution. We will analyze the ionization dynamics and generate Cu spectrum using the temperature and density conditions obtained from non-LTE simulations and compare our results with recent K-shell experimental spectrum of Cu implosions on the Z machine at the Sandia national Laboratories. Our self-consistently generated atomic model employs an extensive atomic level structure and data to accurately model the plasma dynamics and the spectroscopic details of the emitted radiation. Spectroscopic modeling of these K- and L-shell emission should also provide quantitative diagnostics of plasma parameters.

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