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Synthetic X-Ray Spectra of Ar and Kr for Analysis of Data from the Z Machine at SNL[1] ARATI DASGUPTA, ROBERT CLARK, WARD THORNHILL, NICHOLAS OUART, JOHN APRUZESE, JOHN GIULIANI, Naval Research Laboratory, Washington, DC, BRENT JONES, DAVE AMPLEFORD, Sandia National Laboratories, Albuquerque, NM — A number of shots employing concentric gas puffs of Ar and Kr on the Sandia National Laboratories ZR acceleartor are being planned, with the goal of optimizating K-shell yield. Experimental data from these implosions can provide a wealth of information about the ionization history of the plasma. Theoretical simulations using accurate atomic and hydrodynamics models will provide synthetic K-and L-shell spectra with which to compare and analyze the data. The presence and dynamics of bright K-shell emitting regions, which could possibly dominate the Kr K-shell yield, can be derived from radially and/or axially resolved, time-dependent spectra. By taking density and internal energy profiles near peak radiative power from the 2-D radiation hydrodynamics model, and post processing this data with a detailed multifrequency radiation transport scheme, the generation and evolution of these bright spots may be simulated. We will present synthetic spectra from the "bright" spots determined from the Ar and Kr 2D simulations, employing a recently developed non-LTE collisional-radiative spectroscopic model that combines the completeness of highly averaged Rydberg states models with the accuracy of detailed models for all important excited states.

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