# SYNTHETIC TIME AND SPACE RESOLVED SPECTRA INCLUDING DOPPLER SPLITTING FROM SIMULATIONS OF STAINLESS STEEL PINCHES ON REFURBISHED Z*

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A two-dimensional radiation MHD model that includes a self-consistent calculation for non-local thermodynamic equilibrium kinetics and ray trace based radiation transport[1] is employed to simulate 65 mm diameter stainless steel double wire array Z machine experiments of 5.0 mg and 2.5 mg, respectively (shots Z1859 and Z1860). Temporal knowledge of the plasma internal energy, ion density, velocity, and opacity at each 2D grid point allows us to postprocess the results to reconstruct the atomic populations at any time and location. With these populations and velocities, we can then apply detailed multifrequency raytrace radiation transport, including Doppler effects, to construct time and axially or radially resolved synthetic spectra. Calculated radially resolved spectra for He-like iron near the time of peak emission are compared with experimental data.

[1] J. W. Thornhill, J. P. Apruzese, *et. al.,* Phys. Plasmas **8**, 3480 (2001).

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