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Modeling of Ion Thermalization in a Ne Gas Pinch[1] J. GIULIANI, J. THORNHILL, A. DASGUPTA, A. VELIKOVICH, J. DAVIS, Plasma Phys. Div. Naval Res. Lab., R. CLARK, Berkeley Res. Assoc., E. KROUPP, D. OSIN, Y. MARON, A. STAROBINTES, E. STAMBULCHIK, V. FISHER, V. BERNSHTAM, Weizmann Inst. Sci., A. FISHER, Technion Univ., C. DEENEY, Depart. of Energy/NNSA — Understanding of the dynamics, population kinetics, and energy budget of a K-shell radiating Z pinch remains a challenging problem in high energy density plasma physics. Large ion kinetic energies have been reported for Ne pinches at $\sim$1 MA.[2] The present work examines the dynamics of this pinch with a 1D radial magnetohydrodynamic simulation code including collisional-radiative ionization dynamics and radiation transport. Synthetic spectra from the simulations can match the measured H-like satellite line profiles if the ion-electron equilibration rate is reduced by a factor of $\sim$10. In anticipation of further experiments, radially resolved synthetic spectra of the satellite lines will also be presented to analyze the plasma structure at stagnation.

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[2]E. Kroupp, et al., PRL, 98, 115001 (2007), D. Osin, Ph.D. Thesis (2008).

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