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2D-RMHD Modeling of the Dynamics of a Ne Gas Puff Z Pinch¹ J. THORNHILL, J. GIULIANI, A. DASGUPTA, A. VELIKOVICH, Y. CHONG, Plasma Physics Division, Naval Research Laboratory, R. CLARK, Berkeley Research Associates, E. KROUPP, D. OSIN, Y. MARON, A. STAROBINETS, E. STAMBULCHIK, V. FISHER, V. BERNSHTAM, Weizmann Institute of Science, A. FISHER, Technion University, C. DEENEY, Department of Energy/NNSA Detailed spatially resolved spectroscopic analysis of a neon gas puff Z pinch on the Weizmann 1MA generator [1,2] indicates that the radius of the K-shell regions grows to a maximum and then decreases during the radiation pulse – the opposite of that calculated by 1D-RMHD models. Here we compare Mach2 2D-RMHD [r-z, high resolution, moving grid, non-LTE atomic populations, 3D ray trace radiation transport] simulation results to the size of the K-shell emission region as inferred from the spectroscopic analysis. In addition 2D, 3-ns time gated visible light images recorded during the neon experiments give us the opportunity to compare with the evolution of the outer pinch radius, r(z,t), as calculated by the 2D-RMHD model. Comparisons with spectroscopically inferred results and simulation results will also be made for electron and ion temperatures as well as internal energy to study the weak ion and electron temperature equilibration observed in the data.

E. Kroupp, et al., PRL, 98, 115001 (2007).
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