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Two-Dimensional Radiation MHD Modeling of Stainless Steel Wire Array Z-Pinch Implosions[1] J.W. THORNHILL, J.L. GIULIANI, J.P. APRUZESE, Y.K. YOUNG, J. DAVIS, A. DASGUPTA, Plasma Physics Division, Naval Research Laboratory, R.W. CLARK, K.G. WHITNEY, Berkeley Scholars, Inc., B. JONES, C.A. COVERDALE, D.J. AMPLEFORD, M.E. CUNEO, Sandia National Laboratories, C. DEENEY, DOE/NNSA — A 2D radiation MHD modeling capability was developed to study large diameter wire array Z-pinch experiments. This model incorporates into the Mach2 MHD code a self-consistent calculation for non-LTE kinetics and ray trace based radiation transport.[2] Such a method is necessary for modeling opacity effects and the high temperature state of K-shell emitting loads. This model is used to investigate ways to mitigate the reduction in K-shell emission caused by unstable plasma implosion behavior. This behavior is especially present in implosions of the large diameter loads needed to match the electrical energy of the Z machine to an appropriate massed load for producing K-shell emission. Non-1D behavior can have many sources, but here we focus on 2D behavior seeded by radiative losses. However, efforts that mitigate the deleterious effects of unstable plasma behavior due to this mechanism are also relevant to other sources of non-ideal plasma implosion behavior.

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

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