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The effect of nonuniformities induced by the magnetic Rayleigh-Taylor instability on the radiation producing shock in z-pinch dynamic hohlraums[1] R.W. LEMKE, J.E. BAILEY, G.A. CHANDLER, T.J. NASH, S.A. SLUTZ, T.A. MEHLHORN, Sandia National Laboratories — Z-pinch experiments were conducted on the Z accelerator in which a nested array, tungsten wire plasma implodes onto a CH_2 foam converter to create a $\sim$135 eV dynamic hohlraum (DH). We present results of an investigation to determine the effect that the magnetic Rayleigh Taylor (MRT) instability has on the radiating shock in a DH, and the associated radiated power. X-ray power exiting the DH was measured using arrays of x-ray diodes and bolometers, and x-ray pinhole cameras viewing along the DH axis recorded time and space resolved images of emission produced by the radiating shock. Measured emission intensities are compared with synthetic x-ray images from 2D, radiation MHD simulations in which the amplitude of MRT perturbations is varied. These comparisons show that the axial uniformity of the shock is insensitive to the MRT amplitude for density perturbations up to 1%. Comparison of measured and simulated x-ray power puts an upper limit on the MRT amplitude, and provides evidence for the validity of some of the assumptions used to measure the power.

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Raymond Lemke
Sandia National Laboratories

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