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A Comparison of Calculated and Experimental X-ray Power Outputs Using a Phenomenological Formula for Enhanced Energy Coupling¹ K.G. WHITNEY, Berkeley Scholars, Inc., J.W. THORNHILL, Plasma Physics Division, Naval Research Laboratory, L.I. RUDAKOV, Icarus Research, Inc., A.L. VELIKOVICH, J. DAVIS, Plasma Physics Division, Naval Research Laboratory, C. DEENEY, C.A. COVERDALE, Sandia National Laboratories — Wire array Z-pinch implosions exhibit a large amount of 3-dimensional substructure in addition to their average 1-dimensional fluid behavior. It has recently been proposed that, due to Hall terms, the diffusion of magnetic field in such an inherently chaotic substructure produces an enhanced resistivity to the flow of current that is proportional to the square of the magnetic field. It was also recently shown that such resistivities are needed to explain the large late-in-time energy couplings that were observed in a set of Saturn, aluminum wire array experiments that were conducted at the Sandia National Laboratories. In this set of experiments, the array mass, radius, and length were varied, and a significant amount of late-time x-ray emission was observed. In this talk, we investigate the ability of the proposed enhanced resistivity formula, when employed in 1-D MHD calculations, to replicate the total and K-shell power data that was recorded in these experiments.

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