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Experiment to determine electrical conductivity and equation of state data from Ohmically exploded tamped planar foils - preliminary diagnostic results and modeling E.L. RUDEN, D.J. AMDAHL, Air Force Research Laboratory, Directed Energy Directorate, D.J. BROWN, T.C. GRABOWSKI, C.W. GREGG, M.R. KOSTORA, B.M. MARTINEZ, J.V. PARKER, Science Applications International Corporation, J.F. CAMACHO, S.K. COFFEY, NumerEx, LLC, P. POULSEN, CAREN Co. — Diagnostic results from initial nondestructive (thick foil, low current) tests are presented for an experiment to simultaneously determine the electrical conductivity, pressure, density, specific energy, and temperature time histories of a planar metal foil tamped by a well characterized transparent material and exploded by a 36 μF, 50 kV rated capacitor bank discharge. Voltage differentials measure the foil's surface electric field, a B-dot probe measures surface current density, and a laser velocity interferometer (VISAR) measures dynamic foil thickness. From such and future filtered photodiode measurements, the desired properties will be inferred up to a few eV and within an order of magnitude of solid density. The purpose of the present phase of the experiment is to develop and validate diagnostic designs, data analysis techniques, and 2-D MHD simulations of the process using the MACH2 code.

Edward Ruden
Air Force Research Laboratory, Directed Energy Directorate

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