Abstract Submitted
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Characterization of Turbulent Non-Uniform Exploding Wire Plasma Using High Resolution Interferometry, Schlieren and Shadowography Imaging[1] J. CAPLINGER, S4 Inc, Fairborn, OH 45432, G. SARKISOV, Raytheon Ktech, Albuquerque, NM 87123, A.J. WALLERSTEIN, V. SOTNIKOV, Air Force Research Laboratory, Wright Patterson AFB, OH 45433, J. LUNDBERG, Z. REED, Riverside Research, Beavercreek, OH 45432 — High resolution interferogram, Schlieren, and shadowgraph imaging has been used to characterize an exploding wire plasma. Using an 80 kV high voltage pulse generator with a rise time of 5 ns, exploding wire plasmas are created in aluminum, gold, tin, stainless steel, platinum and silver wires. The plasma is probed over a period of 3-7 ns using a 532 nm frequency doubled Nd:YAG Q-switched laser. The resulting laser radiation is imaged as an interferogram using an air-wedge interferometer, a shadowgraph and as a Schlieren image using two CCDs. Calculations resulting from the interferograms reveal ionizations between 10-20% for Aluminum wires at atmospheric pressure. This is confirmed by the Schlieren images as the refraction caused by neutrals is dominant. Single wire, two parallel wires, and other two wire configurations are investigated. Additionally, influence of chamber pressure on plasma uniformity, shock wave propagation velocity and instabilities is presented.

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