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Theory and Modeling of the Plasma Liner Experiment (PLX)[1]
J.T. CASSIBRY, M.D. STANIC, UAH, T.J. AWE, D.S. HANNA, J.S. DAVIS, S.C. HSU, LANL, F.D. WITHERSPOON, HyperV Tech. Corp., UAH COLLABORATION, LANL COLLABORATION, HYPERV TECH. CORP. COLLABORATION
— High pressures and temperatures may be generated at the center an imploding plasma liner. These phenomena are being studied on the Plasma Liner Experiment (PLX) in which a spherical liner is formed via the merging of plasma jets. The basic physical processes include pulsed plasma acceleration, plasma jet propagation in a vacuum, plasma jet merging, liner formation, liner implosion, stagnation, and rarefaction. Each of these processes is dominated by different physics, requiring different models. For example, λ_{ei} at the jet merging radius may be $\sim$1 cm, so that liner formation is partially collisionless, while liner implosion is collision dominated. Further, the liner transitions from optically thin to gray during the implosion. An overview of the theory and modeling plan in support of PLX will be given, which includes 1D rad-hydro, 3D hydro, 3D MHD, 2D PIC, and 2D hybrid codes. We will emphasize our recent 3D hydro modeling, which provides insights into liner formation, implosion, and effects of initial jet parameters on scaling of peak pressure.

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Jason Cassibry
UAH

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