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Differentiating Different Modeling Assumptions in Simulations of MagLIF loads on the Z Generator[1] C.A. JENNINGS, M.R. GOMEZ, E.C. HARDING, P.F. KNAPP, D.J. AMPLEFORD, S.B. HANSEN, M.R. WEIS, M.E. GLINSKY, K. PETERSON, Sandia National Labs, J.P. CHITTENDEN, Imperial College,London — Metal liners imploded by a fast rising (<100ns) current to compress a magnetized, preheated fuel offer the potential to efficiently reach fusion conditions [S.A. Slutz et al. Phys. Plasmas 17, 056303 (2010)]. These MagLIF experiments have had some success [M.R. Gomez et al Phys. Rev. Lett. 113, 155003(2014)]. While experiments are increasingly well diagnosed, many of the measurements (particularly during stagnation) are time integrated, limited in spatial resolution or require additional assumptions to interpret in the context of a structured, rapidly evolving system. As such, in validating MHD calculations, there is the potential for the same observables in the experimental data to be reproduced under different modeling assumptions. Using synthetic diagnostics of the results of different pre-heat, implosion and stagnation simulations run with the Gorgon MHD code, we discuss how the interpretation of typical Z diagnostics relate to more fundamental simulation parameters. We then explore the extent to which different assumptions on instability development, current delivery, high-Z mix into the fuel and initial laser deposition can be differentiated in our existing measurements.

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