Abstract Submitted
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Implosion Magnetohydrodynamics for ICF: new physics and capsule designs[1] DARWIN HO, Lawrence Livermore Natl Lab, G. ZIMMERMAN, LLNL, R. KULSRUD, PPPL, J. MOODY, T. WOODS, P. AMENDT, LLNL — Simulations with a 50 T seed B-field is observed to make the requirements for ignition less stringent. (Ref 1) For high-yield implosions, a seed field does not increase the yield but increases the the implosion robustness. This allows implosion designs to consider trade-offs between reducing the laser energy while preserving the implosion robustness and yield, or using the same laser energy but increasing the implosion robustness and yield by using a larger capsule/hohlraum system. We also report novel MHD features here. (1) The ellipticity of the prolate imploding shock in magnetized implosions is higher for ice-layered capsules than for warm symcaps because of the difference in MHD shock propagation behavior. Analytical theory agrees well with simulations for the shape of the prolate shock. (2) The ellipticity of the shock creates an oblate shape in the hotspot ion and electron temperature contours. The elongation of the oblate shape is more pronounced for ice-layered capsule than for warm symcap. 1 Perkins, Ho, Logan, Zimmerman et al., Phys. Plasmas 24, 062708 (2017).

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