Abstract Submitted
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Investigation of Electric and Self-Generated Magnetic Fields in Implosion Experiments on OMEGA I.V. IGUMENSHCHEV, P.M. NILSON, V.N. GONCHAROV, Laboratory for Laser Energetics, U. of Rochester, C.K. LI, A.B. ZYLSTRA, R.D. PETRASSO, PSFC, MIT — Electric and self-generated magnetic fields in direct-drive implosion experiments on the OMEGA laser[1] were investigated using proton radiography. The experiments use plastic-shell targets with various surface defects (glue spot, wire, and stalk mount) to seed perturbations and generate localized electromagnetic fields at the ablation surface and in the plasma corona surrounding the targets. Proton radiographs show features from these perturbations and quasi-spherical multiple shell structures around the capsules at earlier times of implosions (up to ∼700 ps for a 1-ns laser pulse) indicating the development of the fields. Two-dimensional magnetohydrodynamic simulations of these experiments predict the growth of magnetic fields up to several MG. The simulated distributions of electromagnetic fields were used to produce proton images, which show good agreement with experimental radiographs. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

[1]T. R. Boehly *et al.*, Opt. Commun. **133**, 495 (1997).

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