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Experiments and Simulations of Laser-Driven Magnetized ICF Targets on OMEGA P.-Y. CHANG, G. FIKSEL, M. HOHENBERGER, J.R. DAVIES, J.P. KNAUER, R. BETTI, Laboratory for Laser Energetics, U. of Rochester, F.H. SÉGUIN, R.D. PETRASSO, PSFC, MIT — Recent experiments on OMEGA have shown that magnetizing the hot spot in a laser-driven inertial confinement fusion experiment leads to an enhancement of the implosion performance. A magnetic seed field of 8 T was embedded into a warm plastic (CH) capsule filled with D_2 gas. The target was imploded in a polar-drive configuration using 40 beams of the OMEGA laser. This resulted in an estimated peak magnetic field of ∼20 MG, and a measured 15% and 30% increase of the ion temperature and the fusion yield with respect to unmagnetized targets. To study the magnetic-field topology and its effects on the target, we have implemented a 2-D, azimuthal symmetry MHD subroutine into the 1-D hydrodynamics code *LILAC*. Since the plasma beta is much greater than unity during the implosion, the magnetic field does not affect the implosion dynamics and behaves as a passive variable. We present results from these simulations and compare them to experimental proton radiography data of an imploding, magnetized target. This work was supported by the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement Nos. DE-FC52-08NA28302 and DE-FG02-04ER54768.

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