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Theory and Simulation of Laser-Driven Magnetic-Field Compression N.W. JANG, R. BETTI, J.P. KNAUER, O.V. GOTCHEV, D.D. MEYERHOFER, Laboratory for Laser Energetics, U. of Rochester — During the compression of the ICF target, the magnetic diffusivity is greatly reduced in the hot, low-density halo—the region of unloaded shell material on the inner surface of the imploding shell. Thus, the imploding cold shell acts like a piston compressing the magnetic field to ultrahigh field strengths. This results in increased hot-spot temperatures due to inhibition of thermal transport in the radial direction. Implosions of cylindrical targets seeded with an axial magnetic field of 10 T[1] are studied with a radiation magnetohydrodynamic simulation code, *LILAC*-MHD. An 860-μm-diam, 1.5-mm-long cylindrical CH target is filled with D_2 and driven by 40 beams of the OMEGA laser. The value of the magnetic field at peak compression exceeds 10^4 T, while the peak temperature in the core exceeds 10 keV, an almost tenfold increase over the case with no seed field. This work was supported by the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement No. DE-FC52-92SF19460.

[1]O. V. Gotchev *et al.*, "A Compact, Tim-Based, Pulsed-Power System for Magnetized Target Experiments on OMEGA," this conference.

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