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Magnetized Hot-Spot Implosions Via Laser-Driven Flux Compression O.V. GOTCHEV, R. BETTI, P. CHANG, J.P. KNAUER, D.D. MEYERHOFER, Laboratory for Laser Energetics, FSC, U. of Rochester, J.A. FRENJE, C.K. LI, M. MANUEL, R.D. PETRASSO, F.H. SÉGUIN, PSFC, MIT — Cylindrical, DD-filled targets were seeded with ∼0.1-MG magnetic fields from low-mass coils, energized by a compact capacitive discharge system. They were then imploded on the OMEGA laser to compress the embedded magnetic field to high values. The compression of the internal magnetic flux was measured with a proton deflectrometry technique[1] optimized for this application. Strong magnetic fields localized in the hot spot were observed. Comparison with Monte Carlo simulations of the proton transport through the target area revealed fields, compressed to many tens of megagauss. Application of the resulting hot-spot thermal insulation to implosions with enhanced gain (or lower ignition-energy requirements than what is possible in conventional ICF) is discussed. The strong magnetic fields generated in this manner can also be used in a variety of non-fusion experiments such as laboratory astrophysics, material science, etc. 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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Orlin Gotchev
Laboratory for Laser Energetics, FSC, U. of Rochester

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