Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

A Compact, TIM-Based, Pulsed-Power System for Magnetized Target Experiments on OMEGA O.V. GOTCHEV, M.D. BARBERO, N.W. JANG, J.P. KNAUER, R. BETTI, Laboratory for Laser Energetics, U. of Rochester — By magnetizing the target and then compressing the magnetic flux to levels sufficient to inhibit thermal transport in the hot spot, one can trigger ignition in massive cryogenic shells imploded with low velocity. The reduction in thermal-conduction losses leads to increased hot-spot temperatures at lower implosion velocities, thus relaxing the energy requirements for ignition. This work describes a compact, pulsed-power system for the generation of a macroscopic seed magnetic field and its integration into such flux-compression experiments on OMEGA. Magnetohydrodynamic simulations[1] predict compression of a 10-T seed field to multimegagauss values. A fast (100-ns) current pulse (up to 60 kA), driven by a TIM-based energy-delivery system, is discharged into a low-mass, double coil that surrounds the laser target. A working prototype has generated a >11-T seed field utilizing a <100-J capacitor bank, laser-triggered spark gap, and a low-impedance (<1-Ω) stripline. This work was supported by the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement No. DE-FC52-92SF19460.

[1]N. W. Jang *et al.*, "Theory and Simulation of Laser-Driven Magnetic Field Compression," this conference.

O.V. Gotchev
Laboratory for Laser Energetics, U. of Rochester

Date submitted: 20 Jul 2006 Electronic form version 1.4