Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Mitigation of Two-Plasmon Decay in Direct-Drive Implosions Using Multilayer Targets D.H. FROULA, V.N. GONCHAROV, R.K. FOLLETT, R.J. HENCHEN, B. YAAKOBI, D.H. EDGELL, A.A. SOLODOV, J.F. MYATT, J.G. SHAW, C. STOECKL, M.J. BONINO, T.C. SANGSTER, Laboratory for Laser Energetics, U. of Rochester — Mitigation of cross-beam energy transfer in direct-drive implosions may increase the hot-electron preheat above acceptable levels for ignition. To study preheat mitigation concepts on OMEGA, a thin layer (0.6 μm) of Si in the target ablator is being considered to increase the electron temperature at the quarter-critical surface. A beryllium inner layer (6 μm thick) is used to increase the hydrodynamic efficiency and an outer layer of CH-doped Si (4 μm thick) reduces the laser imprint. Spatially resolved Thomson-scattering measurements show a 15% increase in the electron temperature at the quarter-critical surface and the time-resolved hot electrons are reduced by a factor of 8 compared with a standard CH target. The shell trajectory in the multilayer targets is significantly faster than the CH target, resulting in a factor-of-3 increase in the neutron yield. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

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Date submitted: 21 Jul 2015 Electronic form version 1.4