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Mixing in thick-walled and pulse-shaped directly driven ICF capsule implosions.

D.C. Wilson¹, F.J. Marshall², P.W. McKenty², V.Yu. Glebov², C. Stoeckl², C.K. Li³, F.H. Séguin³, D.G. Hicks³, R.D. Petrasso³, C.W. Cranfill¹, G.D. Pollak¹ & W.J. Powers¹

1. Los Alamos National Laboratory
Los Alamos, New Mexico, USA
dcw@lanl.gov

2. Laboratory for Laser Energetics,
U. of Rochester, USA

3. Plasma Science and Fusion Center,
Massachusetts Institute of Technology, USA

The multi-fluid interpenetration mix model of Scannapieco and Cheng (Phys. Lett A, 2002) has been applied to X-ray driven inertial confinement fusion capsules (ICF) (Wilson *et al.*, Phys. Plasmas, 2003), to double shell ICF capsules (Wilson *et al.* 2004a), and to directly driven capsules with a 20 μm wall thickness using a 1ns square laser pulse with both symmetric (Wilson *et al.*, 2004b) and asymmetric illumination (Christensen *et al.*, 2004). In general it was found that using atomic mixing the single mixing parameter could fit almost all the data with a value of 0.05 ± 0.02 . In this paper the model is tested against data from a wider range of directly driven capsules with wall thicknesses up to 40 μm , and with square, moderate (PS26) and extreme (low adiabat) pulse shapes (Marshall *et al.*, 2000a,b, 2004). In addition to yield, burn temperature, and burn history, model simulations are post-processed to compare with X-ray image profiles, secondary neutron yields, and shell rho-r measurements.

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