Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Mix Degradation in DT Filled Capsules When Shock and Compression Yields are Resolved D.C. WILSON, H.W. HERRMANN, J.M. MACK, C.S. YOUNG, G.A. KYRALA, J.H. COOLEY, L. WELSER-SHERRILL, J.R. LANGENBRUNNER, S.C. EVANS, T.J. SEDILLO, Los Alamos National Laboratory, C.J. HORSFIELD, D.W. DREW, AWE, Aldermaston UK, E.K. MILLER, NSTec STL, V. YU. GLEBOV, Laboratory for Laser Energetics, U. of Rochester — 1100μm dia. DT(5atm) + 3He (0,1,or 5 atm) filled glass capsules were directly driven on the Omega laser to measure yield, X-ray images, and especially the burn time history. The 600ps square pulse increases time separation between the "shock" yield (before the reflected shock reaches the incoming shell) and later "compression" yield. Matching the timing and amount of this early "shock" yield in the implosions fixes the electron conduction flux limiter. The Scannapieco and Cheng mix model results are compared with measured yield, burn temperatures and histories, and gated X-ray images. The experiment shows degradation of both the shock and compression yield, but relatively more degradation of the compression yield than explained by the model. The first gated images, which occur when the reflected shock reaches the incoming shell, show significant mixing has already occurred. But the lack of X-ray emission 60ps earlier suggests no mixing then. Work supported by US DOE/NNSA, performed by LANL, operated by LANS LLC under Contract DE-AC52-06NA25396. LA-UR-07-4929.

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Date submitted: 23 Jul 2007 Electronic form version 1.4