Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Visualizing hydrodynamic mix at capsule stagnation using spectroscopic marker layers in ICF implosions on the NIF[1] B. BACHMANN, L. R. BENEDETTI, D. T. CASEY, L. DIVOL, T. DOEPPNER, D. CLARK, B. HAMMEL, M. HOHENBERGER, D. E. HINKEL, C. KRAULAND, O. L. LANDEN, M. MACDONALD, A. MACPHEE, L. MASSE, J. PARK, L. A. PICKWORTH, J. E. RALPH, M. SCHNEIDER, V. A. SMALYUK, D. THORN, C. WEBER, K. WIDMANN, Lawrence Livermore Natl Lab — Hydrodynamic instabilities in ICF implosions can cause ablator material mixing into the hot spot plasma and shell rho-r variations which adversely impact the hot spot assembly and subsequent nuclear performance. To better understand this process in indirectly driven capsule implosions at the NIF, we have added a thin Ge dopant layer at the gas-ablator and ice-ablator interface in a series of non-DT layered symmetry capsule (Symcap) and DT layered implosions. This provides a spectroscopic marker for visualizing hydrodynamic mix during capsule stagnation. Comparison of the high-resolution, spectrally filtered Symcap hot spot images with those from 'standard candle' Symcap implosions that do not have a Ge dopant allows us to measure how far ablator material is mixed into the hot spot. Complementary x-ray spectroscopy measurements constrain the thermodynamic state of the mixed ablator material. While the Symcap experiment shows enhanced x-ray emission from both the tent and fill-tube locations, the subsequent Ge- and Si-doped layered DT experiments show enhanced x-ray emission dominated by the fill-tube perturbation.

[1]This work performed under the auspices of the U.S. DOE by LLNL under Contract DE-AC52-07NA27344

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Date submitted: 03 Jul 2019 Electronic form version 1.4