Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Assessment of the impact that the capsule fill tube has on implosions conducted with high density carbon ablators[1] ARTHUR PAK, L.R. BENEDETTI, L. F. BERZAK HOPKINS, D. CLARK, L. DIVOL, E. L. DEWALD, D. FITTINGHOFF, N. IZUMI, S. F. KHAN, O. LANDEN, S. LEPAPE, T. MA, E. MARLEY, S. NAGEL, Lawrence Livermore National Laboratory, P. VOLEGOV, Los Alamos National Laboratory, C. WEBER, D. K. BRADLEY, D. CALLAHAN, G. GRIM, O. A. HURRICANE, P. PATEL, M. B. SCHNEIDER, M. J. EDWARDS, Lawrence Livermore National Laboratory — In recent inertial confinement implosion experiments conducted at the National Ignition Facility, bright and spatially localized x-ray emission within the hot spot at stagnation has been observed. This emission is associated with higher Z ablator material that is injected into the hot spot by the hydrodynamic perturbation induced by the 5-10 um diameter capsule fill tube. The reactivity of the DT fuel and subsequent yield of the implosion are strongly dependent on the density, temperature, and confinement time achieved throughout the stagnation of the implosion. Radiative losses from higher Z ablator material that mixes into the hot spot as well as non-uniformities in the compression and confinement induced by the fill tube perturbation can degrade the yield of the implosion. This work will examine the impact to conditions at stagnation that results from the fill tube perturbation. This assessment will be based from a pair of experiments conducted with a high density carbon ablator where the only deliberate change was reduction in fill tube diameter from 10 to 5 um. An estimate of the radiative losses and impact on performance from ablator mix injected into the hot spot by the fill tube perturbation will be presented.

[1]This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Con- tract DE-AC52-07NA27344.

Arthur Pak
Lawrence Livermore National Laboratory

Date submitted: 13 Jul 2017 Electronic form version 1.4