Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Results from the MARBLE Campaign on the National Ignition Facility: Implosion of Foam-Filled Capsules for Studying Thermonuclear Burn in the Presence of Heterogeneous Mix[1] T. J. MURPHY, M. R. DOUGLAS, T. CARDENAS, B. G. DEVOLDER, J. R. FINCKE, M. A. GUNDERSON, B. M. HAINES, C. E. HAMILTON, Y. H. KIM, M. N. LEE, J. A. OERTEL, R. E. OLSON, R. B. RANDOLPH, R. C. SHAH, J. M. SMIDT, Los Alamos National Laboratory — The MARBLE[2] campaign on NIF investigates the effect of heterogeneous mix on thermonuclear burn for comparison to a probability distribution function (PDF) burn model.[3] MARBLE utilizes plastic capsules filled with deuterated plastic foam and tritium gas. The ratio of DT to DD neutron yield is indicative of the degree to which the foam and the gas atomically mix. Platform development experiments have been performed to understand the behavior of the foam and of the gas separately using two types of capsule. The first uses partially deuterated foam and hydrogen gas fill to understand the burn in the foam. The second uses undeuterated foam and deuterium gas fill to understand the dynamics of the gas. Experiments using deuterated foam and tritium gas are planned. Results of these experiments, and the implications for our understanding of thermonuclear burn in heterogeneously mixed separated reactant experiments will be discussed.

[1]This work is supported by US DOE/NNSA, performed at LANL, operated by LANS LLC under contract DE-AC52-06NA25396.
[2]T. J. Murphy *et al* J Phys:Conf Series **717**, 012072 (2016).
[3]J. R. Fincke, unpublished.

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Date submitted: 14 Jul 2016 Electronic form version 1.4