

Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

The Use of Tritium in D, H, and ^3He Gas Filled Plastic Capsules at NIF DOUGLAS WILSON, E.S. DODD, G.P. GRIM, H.W. HERRMANN, Los Alamos National Laboratory, M.M. MARINAK, S.M. SEPKE, M.V. PATEL, N.B. MEEZAN, D.A. CALLAHAN, M.J. MORAN, M.J. EDWARDS, Lawrence Livermore National Laboratory — The addition of tritium gas to the plastic symmetry capsules designed for the National Ignition Facility offers the opportunity for enhanced nuclear diagnostics of capsule performance. Without mix between shell and fuel, Rev 5 symmetry capsules calculate to give as much as 1.2×10^{16} D+T neutrons for 50:50 D:T. If such yields can be reached, alpha particle heating increases the ion temperature by ~ 0.5 keV. Based on 2009 experiments we expect only 0.1-0.3 of clean yields. Actual yields less than 1×10^{14} allow neutron imaging, while gamma rays show the burn history and measure shell rho-r. A deuterated layer in the plastic shell with nearly pure tritium gas might also produce D+T yields above 1×10^{14} and could test mix models. A 99:1 DT capsule calculates to produce 1×10^{15} D+T and 1×10^{14} D+D neutrons which could simultaneously measure D+D and D+T neutron Doppler broadening. Calculations show a 0.2 keV ion temperature difference. This work was funded by the USDOE at Los Alamos and Lawrence Livermore National Laboratories.

D. C. Wilson
Los Alamos National Laboratory

Date submitted: 19 Jul 2010

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