

Abstract Submitted
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Neutron Yield and Ion Temperature from DD and DT Fusion in National Ignition Facility High-Foot Implosions J.P. KNAUER, Laboratory for Laser Energetics, U. of Rochester, M. GATU JOHNSON, J.A. FRENJE, R.D. PETRASSO, PSFC, MIT, J.A. CAGGIANO, D.A. CALLAHAN, D.T. CASEY, C.J. CERJAN, T. DOEPPNER, M.J. ECKART, G.P. GRIM, E.P. HARTOUNI, R. HATARIK, D.E. HINKEL, O.A. HURRICANE, A. KRITCHER, S. LE PAPE, T. MA, D.H. MUNRO, P.K. PATEL, J.E. RALPH, D.B. SAYRE, B.K. SPEARS, C.B. YEAMANS, LLNL, J.D. KILKENNY, General Atomics — Simultaneous measures of neutrons emitted from DT fusion implosions are postulated to provide insight into the fuel conditions during neutron emission.^{1,2} Neutron spectral diagnostics of National Ignition Facility “high-foot” implosions measure both the DT and DD fusion neutron spectra. Equivalent ion temperature is measured from the width of the DT and DD neutron emission and the respective yields from the peak areas. This work has focused on reasons for differing inferred temperatures from the DT and DD spectra and the yield ratio. Spatial and temporal averages of the DT and DD reactivities as corrections to the homogeneous and static temperature distributions are shown. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

¹B. Appelbe and J. Chittenden, *Plasma Phys. Control. Fusion* **53**, 045002 (2011).

²T. J. Murphy, *Phys. Plasmas* **21**, 072701 (2014).

J.P. Knauer
Laboratory for Laser Energetics, U. of Rochester

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