Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

How our physics understanding changes when we move from 2D to 3D measurements in ICF plasmas[1] D.J. SCHLOSSBERG, R.M. BIONTA, D.T. CASEY, M.J. ECKART, D.N. FITTINGHOFF, K.D. HAHN, E.P. HARTOUNI, J. JEET, S.M. KERR, A.J. MACKINNON, A.S. MOORE, Lawrence Livermore Natl Lab, M.S. RUBERY, UK Atomic Weapons Establishment, V. GEPPERT-KLEINRATH, P.L. VOLEGOV, Los Alamos Natl Lab — Recent inertial confinement fusion (ICF) measurements have highlighted the importance of 3D asymmetry effects on implosion performance. One prominent example is the bulk drift velocity of the deuterium-tritium plasma undergoing fusion ("hot spot"). Upgrades to the National Ignition Facility neutron time-of-flight diagnostics now provide v_{bulk} to better than 1 part in 10^4, and enable cross-correlations with other measurements. This talk presents the impact of v_{bulk} on neutron yield, downscatter ratio, apparent ion temperature, electron temperature, and 2D x-ray and neutron emission. The benefits of using cross-diagnostic analysis to obtain 3D views of the plasma is highlighted. A comparison with modeling is made, and future concepts for measuring hot spot flows is presented. This research reflects the growing interest in 3D measurements of the national ICF community.

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

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Date submitted: 29 Jun 2020 Electronic form version 1.4