Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

**Diagnosing Mix in NIF Polar Direct Drive Capsule Implosions**
PAUL BRADLEY, T. MURPHY, G. KYRALA, N. KRASHENINNIKOVA, P. HAKEL, M. SCHMITT, I. TREGILLIS, S. HSU, R. KANZLEITER, K. OBREY, J. FINCKE, S. BATHA, Los Alamos National Laboratory — We have investigated the role of turbulent mix in polar direct drive capsule implosions by modeling the a series of such Defect Induced Mix Experiment implosions (fielded in 2012 and 2013) on the National Ignition Facility with a two-dimensional Eulearian radiation-hydrodynamic code. The capsules had an outer diameter of ∼2250 microns, were composed of 42 micron thick CH plastic ablators, and filled with 5 atm of deuterium or hydrogen gas. The capsules were imploded using 320 to 670 kJ laser energy in a 2.15 ns flat-top pulse. We use neutron yield and x-ray spectra from a dopant layer as mix diagnostics. The simulated yields, bang times, and ion temperatures follow the experimental trends. We will also show how the simulated spectral emission from the dopant layer compares to the data and how this implies about 1 micron of the shell mixes into the gas. We will discuss what these results imply for the extent of mix in ICF capsules. Work performed by Los Alamos National Laboratory under contract DE-AC52-06NA25396 for the National Nuclear Security Administration of the U.S. Department of Energy.

Paul Bradley
Los Alamos National Laboratory

Date submitted: 11 Jul 2013 Electronic form version 1.4