

Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Predicted ICF Neutron Spectrum Corrections from Simulation¹

JOHN FIELD, DAVE MUNRO, BRIAN SPEARS, LUC PETERSON, SCOTT BRANDON, JIM GAFFNEY, JIM HAMMER, ANDREA KRITCHER, RYAN NORA, PAUL SPRINGER, Lawrence Livermore National Laboratory — Produced neutron spectra have long been used as a diagnostic of ICF implosions. The neutron spectrum width is characteristic of the burn temperature as well as the variance of the burning region's fluid motion.^{2,3} Corrections to higher moments of the spectrum are thought to be diagnostic as well.⁴ Because of the large neutron fluxes at the NIF, we expect to have the opportunity to measure these corrections and compare with simulation. We will discuss a post-process platform that we have built for extracting these moment corrections as well as many other extensive quantities from the hydrodynamic simulations, and report on the predicted neutron spectrum corrections recently calculated for a large suite of implosion simulations in one, two, and three dimensions with varying drive symmetry and overall convergence ratio. We are particularly interested in the observable effects on the neutron spectrum along different lines of sight from the dimensional symmetry constraint in the simulated hydrodynamics.

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

²H. Brysk, *Plasma Phys.*, Vol. 15, pp. 611-617 (1973).

³L. Ballabio, J. Kallne, G. Gorini, *Nuclear Fusion*, Vol. 38, No. 11, (1998).

⁴D. Munro, manuscript in preparation.

John Field
Lawrence Livermore National Laboratory

Date submitted: 24 Jul 2015

Electronic form version 1.4