Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Integrated simulations of capsule implosions in low gas-fill hohlraums at the National Ignition Facility[1] JOSE MILOVICH, DANIEL CASEY, OGDEN JONES, OTTO LANDEN, Lawrence Livermore Natl Lab — Current capsule implosions at the National Ignition Facility (NIF) using high-density-carbon ablators and laser energies close to 2MJ have shown neutron yields in excess of 50 KJ. Improving on this performance requires a deeper understanding of the different degradation mechanism affecting the quality of NIF implosions. While it is likely that no single cause is responsible, the latest implosions have shown considerable fuel areal density variations consistent with a low-order mode 1 asymmetry. A current working hypothesis attributes these asymmetries to a combination of beam to beam variations in the laser delivery and possibly coupling to target features [1], such as target positioning and/or diagnostic windows needed for x-ray imaging. To understand the causes of these asymmetries a 3D integrated simulation model (using the code HYDRA) has been developed and used to investigate several relevant NIF implosions. Our simulations investigate and quantify the impact of the different portions of the laser pulse on implosion asymmetry and experimental observables. We will compare our results with measurements and quantify the impact of the laser and target features. [1] B. McGowan et al. Paper presented at IFSA 2019

[1]Prepared by LLNL under Contract DE-AC52-07NA27344

Jose Milovich
Lawrence Livermore Natl Lab

Date submitted: 02 Jul 2019 Electronic form version 1.4