Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Robust spherical direct-drive design for NI LAURENT MASSE, O. HURRICANE, P. MICHEL, R. NORA, M. TABAK, Lawrence Livermore Natl Lab, LAWRENCE LIVERMORE NATL LAB TEAM — Achieving ignition in a direct-drive or indirect-drive cryogenic implosion is a tremendous challenge. Both approaches need to deal with physic and technologic issues. During the past years, the indirect drive effort on the National Ignition Facility (NIF) has revealed unpredicted lost of performances that force to think to more robust designs and to dig into detailed physics aspects. Encouraging results have been obtained using a strong first shock during the implosion of CH ablator ignition capsules. These "high-foot" implosion results in a significantly lower ablation Rayleigh-Taylor instability growth than that of the NIC point design capsule. The trade-off with this design is a higher fuel adiabat that limits both fuel compression and theoretical capsule yield. The purpose of designing this capsule is to recover a more ideal one-dimensional implosion that is in closer agreement to simulation predictions. In the same spirit of spending energy on margin, at the coast of decreased performance, we are presenting here a study on "robust" spherical direct drive design for NIF. This 2-Shock direct drive pulse shape results in a high adiabat (_>3) and low convergence (<17) implosion designed to produce a near 1D-like implosion. We take a particular attention to design a robust implosion with respect to long-wavelength non uniformity seeded by power imbalance and target offset. This work was performed under the auspices of the Lawrence Livermore National Security, LLC, (LLNS) under Contract No. DE-AC52-07NA27344

Laurent Masse
Lawrence Livermore Natl Lab

Date submitted: 19 Jul 2016 Electronic form version 1.4