Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

OMEGA Subscale Cryogenic Implosions in Symmetric and Polar-Direct-Drive Beam Geometry[1] W. THEOBALD, P.B. RADHA, S.P. REGAN, K.S. ANDERSON, R. BETTI, E.M. CAMPBELL, D. CAO, C.J. FORREST, V.YU. GLEBOV, V.N. GONCHAROV, V. GOPALASWAMY, I.V. IGUMENSHCHEV, T. JOSHI, S.T. IVANCIC, J.P. KNAUER, A. LEES, O.M. MANNION, F.J. MARSHALL, M. MICHALKO, Z.L. MOHAMED, D. PATEL, R.C. SHAH, C. STOECKL, C.A. THOMAS, Laboratory for Laser Energetics, U. of Rochester, M. GATU JOHNSON, PSFC, MIT — An overview of the first subscale implosions of cryogenically layered deuterium–tritium targets on OMEGA in 40-beam polar-direct-drive (PDD) and 60-beam symmetric direct-drive (SDD) configurations will be presented. Those implosions use a hydro-scaled version of the best-performing full-scale SDD implosion with a smaller target, small-spot phase plates, and about half of the laser energy. The goal is to assess the effect on implosion performance from the PDD geometry. Initial results indicate that PDD neutron yields and ρR's are 45% and 70%, respectively, of that of companion SDD implosions. The partition of the ring energy is varied while keeping the total laser energy constant, significantly affecting the symmetry of the imploding shell and the shape of the hot spot. The statistical approach [Gopalaswamy et al., Nature 565, 581 (2019)] will be applied to optimize PDD performance by varying parameters such as DT ice thickness, target size, and ring energy partition.

[1]This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0003856.

Wolfgang Theobald
University of Rochester

Date submitted: 26 Jun 2020 Electronic form version 1.4