Abstract Submitted
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High-Performance Cryogenic Designs for OMEGA and the National Ignition Facility V.N. GONCHAROV, T.J.B. COLLINS, J.A. MAROZAS, S.P. REGAN, R. BETTI, T.R. BOEHLY, E.M. CAMPBELL, D.H. FROULA, I.V. IGUMENSHCHEV, R.L. MCCRORY, J.F. MYATT, P.B. RADHA, T.C. SANGSTER, A. SHVYDKY, Laboratory for Laser Energetics, U. of Rochester — The main advantage of laser symmetric direct drive (SDD) is a significantly higher coupled drive laser energy to the hot-spot internal energy at stagnation compared to that of laser indirect drive. Because of coupling losses resulting from cross-beam energy transfer (CBET), however, reaching ignition conditions on the NIF with SDD requires designs with excessively large in-flight aspect ratios (~ 30) . Results of cryogenic implosions performed on OMEGA show that such designs are unstable to short-scale nonuniformity growth during shell implosion. Several CBET reduction strategies have been proposed in the past.[1] This talk will discuss high-performing designs using several CBET-mitigation techniques, including using drive laser beams smaller than the target size and wavelength detuning. Designs that are predicted to reach alpha burning regimes as well as a gain of $\sim$ 10 to 40 at the NIF-scale will be presented. Hydrodynamically scaled OMEGA designs with similar CBET-reduction techniques will also be discussed. This material is based upon work supported by the Department Of Energy National Nuclear Security Administration under Award Number DENA0001944.

[1]I. V. Igumenshchev *et al.*, Phys. Plasmas **19**, 056314 (2012); D. H. Froula *et al.*, Phys. Plasmas **20**, 082704 (2013).

V.N. Goncharov
Laboratory for Laser Energetics, U. of Rochester

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