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Understanding the Performance of Low-Adiabat Cryogenic Implosions on OMEGA V.N. GONCHAROV, T.C. SANGSTER, R. EPSTEIN, S.X. HU, I.V. IGUMENSHCHEV, C.J. FORREST, D.H. FROULA, F.J. MARSHALL, D.T. MICHEL, P.B. RADHA, W. SEKA, C. STOECKL, Laboratory for Laser Energetics, U. of Rochester, J.A. FRENJE, M. GATU JOHNSON, PSFC, MIT — While the moderate-adiabat (α >3.5) cryogenic implosions on OMEGA are well understood using multidimensional hydrocode simulations, the performance of lower-adiabat implosions is degraded relative to code predictions. The potential degradation mechanisms (not fully accounted for in simulations) include target-nonuniformity sources (excessive laser imprint, target debris, beam-overlap nonuniformity) and inaccuracies in laser-coupling modeling, especially during the pulse rise. To address the target-stability issues, target designs with thicker ice layers and smaller implosion velocities are considered. These targets have smaller in-flight aspect ratios, making them less susceptible to hydrodynamic instability growth. To address inaccuracies in laser coupling, a design with a slower main pulse rise is considered. This talk will summarize progress made on these issues. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

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