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Analysis and Extrapolation of HighestPerforming OMEGA DT Layered Implosions to National Ignition Facility Energy DHRUMIR PATEL, RICCRADO BETTI, University of Rochester, KA MING WOO, Laboratory for Laser Energetics, VARCHAS GOPALASWAMY, University of Rochester, ARIJIT BOSE, Massachusetts Institute of Technology — OMEGA optimization campaigns produced both highest neutron yields 1.51 10^{14} and areal densities of 160 mg/cm^2. The 2-D deceleration hydrodynamic code *DEC2D* was used to reproduce experimental observables (yield, areal density, hot-spot size, neutron-averaged ion temperature, burnwidth, and bang time). This was done by extracting hydrodynamic profiles at peak velocity from a 1-D *LILAC* simulation and by simulating the deceleration phase in *DEC2D* with imposed low mode and mid-mode of arbitrary amplitude to match all the observables. Then the extrapolation to the National Ignition Facility (NIF) energy of 1.9 MJ and 2.5 MJ was carried by simulating the deceleration phase of a NIF-scaled target with scaled perturbations. In addition, the performance for NIFscaled implosions were projected with corrected (removed) individual modes to assess the highest possible performance. Performance degradation caused by hot-electron preheat was also assessed by including a hot-electron source in the simulations to match the measured hard x-ray signal. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0003856.

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