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Hydroscaling and Alpha Heating in High Adiabat Layered Implosions KEVIN BAKER, OGGIE JONES, ANNIE KRITCHER, Lawrence Livermore Natl Lab, CLIFF THOMAS, LLE, DAN CASEY, MATHAS HOHENBERGER, SHAHAB KHAN, RICCARDO TOMMASNI, EDDIE DEWALD, BRIAN SPEARS, TILO DOEPPNER, PRAV PATEL, DEBBIE CALLAHAN, OMAR HURRICANE, NINO LANDEN, CHRIS WEBER, BEN BACHMANN, RICHARD BIONTA, KELLY HAHN, DAVID FITTINGHOFF, DAVE SCHLOSSBERG, Lawrence Livermore Natl Lab, MARIA GATU-JOHNSON, MIT, PETR VOLEGOV, KEVIN MEANEY, YONGHO KIM, LANL — High adiabat implosions in inertial confinement fusion (ICF) are designed to be more robust to detrimental plasma and hohlraum physics than their lower adiabat counterparts. They drive a strong first shock into the ablator as well as into the DT fuel, reducing the sensitivity of the integrated system to uncertainties in shock-timing, preheat, and instabilities in the ablator and at the fuel-ablator interface. The higher adiabat enables a short pulse which simplifies hohlraum physics by limiting the extent of difficult to model dynamics such as gold bubble expansion, plasma filling of the hohlraum, and stagnation and interpenetration of the wall, capsule and gas interfaces and subsequent laser propagation through those regions. We report on DT layered implosions used to test the level of alpha heating driven in these high adiabat implosions and the hydroscaling of these implosions between two scales, scaled by x1.125. We present hydroscalings of the hotspot parameters which are shown to scale differently with the scale factor than no alpha heating analytic theory predicts. *This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

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