Abstract Submitted
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Compression versus first shock strength in indirect-drive NIF implosions[1] OTTO LANDEN, PETER CELLIERS, HARRY ROBEY, LAURA BERZAK HOPKINS, STEVE HAAN, JOHN LINDL, Lawrence Livermore Natl Lab — NIF indirect-drive cryogenic DT implosions have used a variety of multi-shock pulse shapes to implode capsules with in-flight fuel adiabats[1] ranging from 1.5 to 4. At a given design adiabat, the stagnated convergence ratio and fuel areal density inferred from the neutron image size and the ratio of downscattered to primary neutron yield shows variability that can be ascribed to shot-to-shot differences in shock timing, ablator dopant level and duration of coast phase. However, the locus of maxima in convergence and fuel areal density is shown to depend principally on the first shock strength that is measured by separate shock timing shots. No clear secondary dependence on hot electron preheat levels that vary by orders of magnitude between designs is observed. The scalings, which include all NIF indirect-drive implosions shot to date, are fitted using an analytic 1D implosion model[2]. [1]H.F. Robey *et. al.*, Phys. Plasmas 23, 056303 (2016). [2]C.D. Zhou and R. Betti, Phys. Plasmas 14, 072703 (2007).

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