Abstract Submitted
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An experimental and numerical study of top/bottom drive asymmetry on NIF implosions[1] BRIAN SPEARS, J. LINDL, J. EDWARDS, R. TOWN, T. MA, A. PAK, D. EDER, A. KRITCHER, P. PATEL, J. MCNANEY, J. KNAUER, D. MUNRO, S. HATCHETT, Lawrence Livermore National Laboratory — NIF x-ray and nuclear diagnostics intermittently suggest unintentionally broken top/bottom (mode 1) symmetry. We present the results of a NIF implosion experiment with intentional top/bottom laser power asymmetry. The controlled asymmetric experiment showed agreement with the diagnostic signatures of mode 1 asymmetry as predicted by numerical simulations. Furthermore, the controlled experimental results provide a context for interpreting the historical archive of data on implosions with unintentional asymmetry. This analysis supports our hypothesis that uncontrolled asymmetries have indeed been present on prior NIF implosions. Numerical simulations confirm that these asymmetries impact implosions at levels varying from minor to substantial. We explore the numerical simulations to show the impact of the asymmetry on implosion hydrodynamics and the associated impact on implosion performance metrics including the Ignition Threshold Factor (eXperimental), ITFX, and the Generalized Lawson Criterion. LLNL-ABS-640682.

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