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Exploring symmetry in near-vacuum hohlraums[1] L. BERZAK HOPKINS, S. LE PAPE, L. DIVOL, N. MEEZAN, A. MACKINNON, D.D. HO, O. JONES, S. KHAN, T. MA, J. MILOVICH, A. PAK, J.S. ROSS, C. THOMAS, D. TURNBULL, P. AMENDT, S. WILKS, LLNL, A. ZYLSTRA, H. RINDERKNECHT, H. SIO, R. PETRASSO, MIT — Recent experiments with near-vacuum hohlraums, which utilize a minimal but non-zero helium fill, have demonstrated performance improvements relative to conventional gas-filled (0.96 – 1.6 mg/cc helium) hohlraums: minimal backscatter, reduced capsule drive degradation, and minimal suprathermal electron generation. Because this is a low laser-plasma interaction platform, implosion symmetry is controlled via pulse-shaping adjustments to laser power balance. Extending this platform to high-yield designs with high-density carbon capsules requires achieving adequate symmetry control throughout the pulse. In simulations, laser propagation is degraded suddenly by hohlraum wall expansion interacting with ablated capsule material. Nominal radiation-hydrodynamics simulations have not yet proven predictive on symmetry of the final hotspot, and experiments show more prolate symmetry than preshot calculations. Recent efforts have focused on understanding the discrepancy between simulated and measured symmetry and on alternate designs for symmetry control through varying cone fraction, trade-offs between laser power and energy, and modifications to case-to-capsule ratio.

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