

Abstract Submitted
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Low-foot rugby hohlraum experiments on the NIF: Wall-gas mix and a connection with missing x-ray drive energy?¹ PETER AMENDT, J. STEVEN ROSS, MARILYN SCHNEIDER, OGGIE JONES, JOSE MILOVICH, JOHN MOODY, LLNL — Rugby-shaped hohlraums on the NIF have shown strong symmetry anomalies when simulated with the high-flux model [1]. The wall-gas interface is Rayleigh-Taylor unstable and may lead to the formation of a late-time mix layer that impedes inner- cone propagation, resulting in a drive asymmetry on the capsule. Due to the rugby curvature near the laser entrance hole, the effect of mix may be more pronounced than in cylinders. At the same time a persistent pattern of 15-25% missing energy has been inferred in gas-filled hohlraums ($\rho \geq 0.96$ mg/cc). A possible physical connection between formation of a mix layer and the plasma adiabatic lapse rate [2], where a temperature-gradient reversal is predicted to occur, is explored. Such a profile reversal, in turn, hinders electron conduction to the dense ($\rho > 0.2$ g/cc) Au region responsible for ~ 900 eV drive x-ray emission, leading to a hotter coronal plasma and reduced hohlraum efficiency. Remedial measures for recovering the loss in hohlraum efficiency through the use of higher-Z gas fills are explored.

[1] M.D. Rosen et al., High Energy Density Physics 7, 180 (2011).

[2] P. Amendt, C. Bellei and S.C. Wilks, Phys. Rev. Lett.. 109, 075002 (2012).

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Peter Amendt
LLNL

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