

Abstract Submitted
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3-D Simulations of NIF Target Implosions¹ JOSE MILOVICH, OGDEN JONES, RICHARD TOWN, DAVID BRADLEY, LLNL — To achieve ignition on the National Ignition Facility (NIF), a cryogenic capsule must be imploded with minimal low mode asymmetries. The NIF was designed with a large number of beams arranged to azimuthally cover the hohlraum wall thereby minimizing asymmetries in this direction. This high degree of regularity has allowed the use of 2-D radiation-hydrodynamics codes to model the behavior of ignition targets. However, there are some target features whose effects are not captured in 2-D simulations and thus require a full 3-D approach. The most important are the starburst, a pattern of four azimuthal cut-outs in the hohlraum wall use to characterize the uniformity of the ice layer, and a single diamond-covered diagnostic hole required to image the equatorial symmetry. To assess their influence on implosion performance we have performed 3D radiation-hydrodynamic simulations and found that they have a non-negligible effect on the shape of the hot spot. We will discuss our results and show how these findings have motivated a redesign of the NIF targets to mitigate their effects.

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