

Inferring ablator mix in DT implosions on the NIF

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In several recent cryogenic DT implosions on the NIF strong localized emission features have been observed in 2D spatial and temporal resolved imaging measurements of the x-ray emission from the hot spot. These features have been attributed to hydro-instability growth of the fill-tube and/or other capsule imperfections bringing ablator mix into the hot spot at stagnation. This can result in the implosion performance being degraded via increased 3D shape perturbations and increased radiation loss from the hot spot. We present analysis of absolute x-ray spectral measurements to infer the radiative energy loss from the hot spot and to estimate the mass of high-Z ablator material mixed into the hot spot. The results are compared with predictions from post-shot simulations of the implosions, and the impact on performance assessed.

This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.