

Abstract Submitted
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Measuring ablator areal density using Neutron Time of Flight at the National Ignition Facility¹ JOSEPH CAGGIANO, MARK ECKART², CHRIS HAGMANN, ROBERT HATARIK, JAMES MCNANEY, DANIEL SAYRE, Lawrence Livermore National Lab, VLADIMIR GLEBOV, JAMES KNAUER, U. Rochester / Laboratory for Laser Energetics — Measuring ablator areal density at bang time is an important implosion performance metric because excessive ablator areal density ($\rho \cdot R$) is indicative of an inefficient drive. Further, large ablator $\rho \cdot R$ values at bang time may be an indication of hydrodynamic instabilities that mix the ablator further into the center of the capsule. Pre-bang measurements from the convergent ablator experiments indicate that 15-20% of the starting mass remains, but that is a measurement performed well before bang time - hence, measurements at bang time can help determine the amount and location of the remaining mass. NTOF measurements focus on elastic and inelastic neutron scattering features from the carbon present in the ablator material to infer carbon and plastic ablator $\rho \cdot R$, and these measurements will be presented and discussed. The numbers are found to compare favorably with other nuclear diagnostic measurements, but are somewhat discrepant from the X-ray diagnostic measurement using the Ross pair filter technique. This discrepancy may indicate a very non-uniform mass distribution at bang time.

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²Retired

Joseph Caggiano
Lawrence Livermore National Lab

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