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Using gamma-ray emission to measure ablator areal density of imploded capsules at the Omega laser[1] N. HOFFMAN, LANL, M. RUBERY, AWE, H. HERRMANN, Y. KIM, C. YOUNG, J. MACK, D. WILSON, A. MCEVOY, S. EVANS, T. SEDILLO, LANL, W. STOEFFL, LLNL, C. HORSFIELD, AWE, V. GLEBOV, LLE — We have measured the ablator areal density of plastic-shell implosions at the Omega laser, using gamma-ray emission from the capsules detected by the prototype Gamma Reaction History (GRH) diagnostic. The intensity of 4.44-MeV gamma emission from ^{12}C nuclei in the ablator is proportional to the product of ablator areal density and yield of fusion neutrons, so by detecting the gammas we can infer the ablator areal density, provided we also have a measurement of total neutron yield. Neutron yield is determined from the nTOF experiment at Omega in our approach; alternatively one could use 16.7-MeV gammas from DT fusion. Inferred values of time-averaged carbon areal density are in the range 10-30 mg/cm^2, for a range of implosions. These values are smaller than predicted values based on 1D simulations, which are typically in the range 30-40 mg/cm^2. We discuss possible reasons for the discrepancy, primarily related to mixing.

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