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Using Proton Radiography to Measure Rayleigh-Taylor-Induced Magnetic Fields M. MANUEL, C. LI, F. SEGUIN, J. FRENJE, D. CASEY, N. SINENIAN, R. PETRASSO, MIT, R. BETTI, V. SMALYUK[1], J. HAGER, LLE, R. TOWN, LLNL, J. KILKENNY, A. NIKROO, GA — The Rayleigh-Taylor (RT) hydrodynamic instability can compromise the shell integrity during the acceleration phase of Inertial Confinement Fusion (ICF) implosions. RT-induced magnetic fields on the order of a mega-Gauss have been theoretically predicted and simulated, but never measured. If present, these self-generated fields will reduce the heat flux and affect the implosion dynamics. A method for measuring these fields using a combination of mono-energetic proton radiography, X-ray radiography, and Monte-Carlo simulations is described. Scaled length estimates based on mono-energetic proton radiographs, suggest RT-induced magnetic fields of order $\sim$0.3 MG. This work was performed at the LLE NLUF, and was supported in part by the US DOE, LLNL, LLE and FSC.

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