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Using proton radiography to measure Rayleigh-Taylor-induced magnetic fields M. MANUEL, C.K. LI, F.H. SEGUIN, J.A. FRENJE, D.T. CASEY, N. SINENIAN, R.D. PETRASSO, MIT, R. BETTI, V.A. SMALYUK, J. HAGER, LLE, J.P. TOWN, LLNL — The Rayleigh-Taylor (RT) hydrodynamic instability has been a concern for 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 heat flux and affect implosion dynamics. An experimental method for measuring these elusive fields using a combination of mono-energetic proton radiography, X-ray radiography, and Monte-Carlo simulations is described, and experimental measurements of RT-induced magnetic fields are presented. This work was performed at the LLE NLUF, and was supported in part by the FSC at U. of R., US DoE, LLNL, and LLE.

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