Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Characterization of Electromagnetic Fields from Proton Radiographs of Laser-Driven Hohlraums J. A. PEARCY, G. D. SUTCLIFFE, T. M. JOHNSON, A. BIRKEL, M. GATU JOHNSON, J. A. FRENJE, F. H. SEGUIN, R. D. PETRASSO, C. K. LI, MIT — A more complete understanding of laser-driven hohlraum plasmas is critical for the continued development and improvement of ICF experiments. For such plasmas, hydrodynamic calculations are very successful in describing the evolution of the plasma at early times. However, at late epochs kinetic effects become dominant and the hydrodynamic description is insufficient. In these hohlraums, self-generated electric and magnetic fields play an important role in determining plasma dynamics and evolution; however, it has largely been uncertain whether electric fields or magnetic fields dominate these systems. To explore this question, we conducted several experiments at the OMEGA laser facility, using monoenergetic proton radiography to probe asymmetrically-driven vacuum-filled gold and plastic hohlraums. In our analysis, we utilized reconstructive methods[1] to infer information about the possible structure of electromagnetic fields in the hohlraum, as well as quantify the relative magnitudes of proton deflections due to these electric and magnetic fields. This work was supported in part by the U.S. DOE, NLUF, and LLE. [1] Bott, A., et al. (2017). Proton imaging of stochastic magnetic fields. Journal of Plasma Physics,83(6), 905830614. doi:10.1017/S0022377817000939

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Date submitted: 03 Jul 2019 Electronic form version 1.4