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Characterizing Field Distribution and Evolution in OMEGA Laser-Driven Vacuum Hohlraums[1] JACOB PEARCY, GRAEME SUTCLIFFE, TIMOTHY JOHNSON, ANDREW BIRKEL, Plasma Science and Fusion Center, Massachusetts Institute of Technology, ARCHIE BOTT, Department of Physics, University of Oxford, DANIEL BARNAK, Laboratory for Laser Energetics, University of Rochester, RICH PETRASSO, CHIKANG LI, Plasma Science and Fusion Center, Massachusetts Institute of Technology — A more complete understanding of laser-driven hohlraum plasmas is critical for the continued development and improvement of indirect-drive ICF experiments. For such plasmas, hydrodynamic calculations are very successful in describing the evolution of the plasma at early times. However, at late times kinetic effects become dominant and the hydrodynamic description is insufficient. In these hohlraums, self-generated electric and magnetic fields also 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 OMEGA, using tri-particle monoenergetic proton and deuteron radiography to probe laser-driven vacuum-filled gold and plastic hohlraums. In our analysis, we utilized reconstructive methods to infer information about the structure of electromagnetic fields in the hohlraum, as well as to quantify the relative magnitudes of proton deflections due to electric and magnetic fields, respectively.

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