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Calculating and Measuring Self-Generated Magnetic Fields in Hohlraums R.P.J. TOWN, W.E. ALLEY, M.J. EDWARDS, J.H. HAMMER, L.J. SUTER, M. TABAK, G.B. ZIMMERMAN, D.H. FROULA, S.H. GLENZER, G. GREGORI, A.J. MACKINNON, P.K. PATEL, Lawrence Livermore National Laboratory, M.G. HAINES, Imperial College London, C.K. LI, R.D. PETRASSO, Massachusetts Institute of Technology — The spontaneous generation of magnetic fields in laser-produced plasmas has been observed experimentally and theoretically by many authors. The main generation term for these fields is the well-known $\nabla n_e \times \nabla T_e$ term, where n_e is the density and T_e is the temperature. For typical laser-plasma conditions Mega-gauss magnetic fields are predicted to be generated. It has previously been shown that the main effect of these magnetic fields for Nova-scale hohlraums is to modify the electron temperature around the laser entrance hole [1]. We will review these calculations and report on recent calculations of NIF design-1 ignition hohlraums. We will also report on simulations to directly measure the magnetic fields using proton deflectometry [2]. We will assess the effect that the magnetic fields have on electron transport, laser-plasma instabilities, and symmetry in ignition and OMEGA hohlraums. [1] S. H. Glenzer, Contrib. Plasma Phys. **40**, 36 (2000). [2] A. J. Mackinnon, *et al*, Rev. Sci. Instrum. **75**, 3531 (2004). This work was performed under the auspices of the U.S. Department of Energy by the University of California, Lawrence Livermore National Laboratory under contract No. W-7405-Eng-48.

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