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Observation of Large Electric Fields on Laser-Irradiated Gold Hohlraums due to Cavity Positive Charging R. PETRASSO, C. LI, F. SEGUIN, J. FRENJE, M. MANUEL, D. CASEY, N. SINENIAN, MIT, P. AMENDT, R. TOWN, O. LANDEN, LLNL, A. NIKROO, C. BACK, J. KILKENNY, GA, J. KNAUER, J. SOURES, LLE — We report on the first observation of an electric field up to $\sim 10^9$V/m, due to cavity positive charging, in laser-irradiated gold hohlraums. A complete time sequence of time-gated, monoenergetic proton radiographs, acquired simultaneously and separately for both 15 and 3 MeV protons, was obtained during a 1.6-ns interval (the hohlraum was driven for $\approx$ 1ns). The radiographs made with different proton energies provide complementary but distinctly different information about the evolution of the fields, thus creating a comprehensive picture of the entire field evolution. These new measurements will advance our understanding of hohlraum physics and fields, and are also likely to have important consequences for inertial confinement fusion and basic laboratory high-energy density physics. This work was performed in part at the LLE National Laser User's Facility (NLUF), and was supported in part by US DOE, LLNL, LLE and the Fusion Science Center at Univ. Rochester.

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