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Spontaneously-Generated Strong Fields around the Hohlraum Laser-Entrance Holes in ICF experiments at the NIF and OMEGA C.K. LI, A. ZYLSTRA, J. FRENJE, F.H. SEGUIN, R. PETRASSO, MIT, P.A. AMENDT, O. LANDEN, LLNL, R. BETTI, D. MEYERHOFER, LLE, J. KILKENNY, A. NIKROO, GA — Comprehensive spectra and spatially-resolved fluence images of 14.7-MeV $D^{3}He$ protons from indirectly-driven implosions at the NIF uniquely revealed the occurrence of strong fields around the laser-entrance hole (LEH) of ignition scale hohlraums. Such fields persist even at ~ 0.5 -1 ns after the laser has turned off, generating large deflections and fluence inhomogeneities in the hohlraum polar direction. The occurrence is unpredictable, and the spatial distributions suggest that such strong fields likely result from the outward flow of the on-axis stagnated plasmas from the LEHs. To quantitatively understand the generation, evolution, interaction, and dissipation of such spontaneously-generated, as well as their effects on hohlraum plasma dynamics, new and relevant experiments probed with backlighting protons are performed at the OMEGA laser facility. These measurements provide novel physics insight and are relevant to ongoing experiments at the NIF. This work was supported in part by the U.S. DOE, LLNL, GA and LLE.

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