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Self-generated magnetic field distributions in multiple-beam produced plasmas PHILIP NILSON, L. WILLINGALE, M. KALUZA, C. KAMBERIDIS, M.S. WEI, Z. NAJMUDIN, R.G. EVANS, A.E. DANGOR, K. KRUSHELNICK, Imperial College, London, IMPERIAL COLLEGE, LONDON TEAM — The importance of self-generated magnetic fields and heat transport inhibition in ignition-scale hohlraums is currently receiving much theoretical attention. In particular, the spatial and temporal evolution of the self-generated magnetic fields and their affect on the plasma evolution inside the hohlraum are not well understood. Megagauss level magnetic fields, attributable to the $\nabla T_e \times \nabla n_e$mechanism, may be sufficiently large inside gas-filled hohlraums to affect the electron energy distribution by magnetizing the electrons ($\omega_c \tau_e > 1$) and reducing the thermal conductivity$\kappa \approx \left(1 + \omega_c^2 \tau_e^2\right)^{-1}$, altering the x-ray emission and uniformity inside the hohlraum, laser-beam propagation and pointing to the inner wall surfaces, parametric instabilities, and beam filamentation. Here, we report on recent measurements taken using the VULCAN laser facility at the Rutherford Appleton Laboratory, wherein the magnetic fields and blow-off plasma generated from planar Au and Al solid targets were characterized.

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