Abstract Submitted
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Global field evolution in magnetic reconnection experiments using laser-powered capacitor coils[1] SHU ZHANG, Princeton University, A. CHIEN, L. GAO, H. JI, K. HILL, PPPL, J. FUCHS, S. CHEN, A. FAZZINI, Ecole Polytechnique, P. BLEOTU, ELI-NP, R. TAKIZAWA, Osaka Univ., A. RASMUS, LANL, S. KLEIN, Univ. of Michigan, X.X. YUAN, Beijing Normal Univ., H. CHEN, LLNL — Magnetic reconnection is a plasma process that leads to the explosive release of magnetic energy from the sudden change of the magnetic field topology. Using capacitor coils driven by 3×10^{15} W/cm^2 high-intensity Titan laser at the Jupiter Laser Facility, we have conducted experiments to study magnetic reconnection in a low-beta plasma with 10s-T magnetic field. The flexibility of this platform enabled us to scan the system size of the reconnection region by changing the coil distance. The plasma profiles between the coils were simulated using radiation-magnetohydrodynamics code (FLASH) and compared with the interferometry measurements. We also used wide-spectrum proton beams (3–20 MeV) to probe the global evolution of the magnetic and electric fields. Electric and magnetic fields were reconstructed and distinguished from the proton radiography images. Details of the experiments, simulations, and the field reconstruction will be presented.

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