Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Relativistic Magnetic Reconnection in the Laboratory[1] KARL KRUSHELNICK, ANTHONY RAYMOND, U.Michigan, CF DONG, PPPL, A MCKELVEY, C ZULICK, U.Michigan, N ALEXANDER, GA, A BHATTACHARJEE, PPPL, PT CAMPBELL, U.Michigan, H CHEN, LLNL, V CHVYKOV, U.Michigan, E DEL RIO, P FITZSIMMONS, GA, W FOX, PPPL, BX HOU, A MAKSIMCHUK, U.Michigan, C MILEHAM, LLE, J NEES, U.Michigan, PM NILSON, C STOEKL, LLE, AGR THOMAS, U.Michigan, MS WEI, GA, V YANOVSKY, L WILLINGALE, U.Michigan — Magnetic reconnection is a fundamental plasma process involving an exchange of magnetic energy to plasma kinetic energy through changes in the magnetic field topology. Here we present experimental measurements using the OMEGA EP laser at LLE and the HERCULES laser at the University of Michigan as well as numerical modeling which indicate that relativistic magnetic reconnection can be driven by short-pulse, high-intensity lasers that produce a relativistic plasma along with very strong magnetic fields. Evidence of magnetic reconnection was identified by the plasma's X-ray emission patterns, changes to the electron energy spectrum, and by measuring the time over which reconnection occurs.

[1]Funded by DOE award no. DE-NA0002727

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Date submitted: 15 Jul 2016 Electronic form version 1.4