

Abstract Submitted  
for the DPP06 Meeting of  
The American Physical Society

**Magnetic reconnection and plasma dynamics in two beam laser-solid interactions** PHILIP NILSON, LOUISE WILLINGALE, MALTE KALUZA, CHRISTOS KAMBERIDES, MINGSHENG WEI, PAULO FERNANDES, ROBERT KINGHAM, ZULFIKAR NAJMUDIN, MALCOLM HAINES, BUCKER DANGOR, KARL KRUSHELNICK, Imperial College London, STEFANO MINARDI, MICHALIS TATARAKIS, TEI Crete, MARGARET NOTLEY, SUJIT BANDYOPADHYAY, MARK SHERLOCK, ROGER EVANS, CLF Rutherford Appleton Laboratory, WOJCIECH ROZMUS, University of Alberta Edmonton — Measurements using the Vulcan Laser Facility (Rutherford Appleton Laboratory, UK) are presented of a self-generated magnetic reconnection geometry that is created at the surface of a planar solid target by two heater beams (1 ns pulse duration,  $1 \times 10^{15} \text{ Wcm}^{-2}$ ). Shadowgraphy and interferometry (using a 10 ps, 263 nm probe beam) and proton deflectometry reveal the formation of high velocity, collimated pairs of jets that originate from the reconnection layer and 0.7 - 1.3 MG magnetic fields at the laser spot edges. Greater jet collimation has been observed using gold target interactions compared to aluminium targets due to radiative cooling effects. Thomson scattering measurements from the reconnection layer are consistent with high electron temperatures ( $T_e > 1 \text{ keV}$ ) in this region. Similarities and differences to the conditions found in the vicinity of inner hohlraum wall surfaces are discussed.

Philip Nilson  
Imperial College London

Date submitted: 19 Jul 2006

Electronic form version 1.4