

Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Interactions at the Laser-Plasma Interface at Intensity of 10^{22} W/cm²¹ T. MATSUOKA, C. MCGUFFEY, S.S. BULANOV, F. DOLLAR, Y. HOROVITZ, E. POWER, J. EASTER, J. NEES, V. CHVYKOV, G. KALINTCHENKO, P. ROUSSEAU, V. YANOVSKY, A. MAKSIMCHUK, K. KRUSHELNICK, FOCUS Center, CUOS, U. of M. — Understanding of interaction at the interface between an ultra-intense laser pulse and plasma is important for high harmonics generation (HHG), generation of attosecond pulses, and in fast ignitor research. The experiments have been conducted for various materials and with different laser polarizations by use of the HERCULES laser facility at the University of Michigan, recently upgraded to 300 TW (10^{22} W/cm²). Near field images of the specular reflected laser light show filamented structure. The specular reflectivity decreases with increasing laser intensity, indicating high absorption of the laser pulse. The images show that the divergence angle increases with the laser intensity indicating deformation of the interface. Measured HH in the EUV range suggest that prepulses in the laser pulse produce preplasma with a few μm scale length. Results were consistent with 2D-PIC simulations, showing that absorption of the laser is strongly dependent on plasma scale length.

¹This work was supported by the NSF grant PHY-0114336.

T. Matsuoka
FOCUS Center, CUOS, U. of M.

Date submitted: 22 Jul 2008

Electronic form version 1.4