

Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

The effect of laser focusing conditions on relativistic plasma wave formation and electron acceleration KARL KRUSHELNICK, Imperial College London, A.G.R. THOMAS, S.P.D. MANGLES, Z. NAJMUDIN, A.E. DANGOR, W. ROZMUS, Dept of Physics, Imperial College London, C.D. MURPHY, P.A. NORREYS, Rutherford Appleton Laboratory, J.G. GALLAGHER, D.A. JAROSZYNSKI, University of Strathclyde, W.B. MORI, UCLA — The effect of laser focusing conditions on the evolution of relativistic plasma waves is studied both experimentally and with particle in cell simulations. For short focal length interactions (small focal spot sizes) broad energy spread electron beams are observed. Simulations show that beam breakup prevents stable propagation of the pulse. However for long focal length geometries (large spot sizes) simulations show a single optical filament capturing almost all of the laser energy. This is characterized by experimentally observed electron beams with multiple or even single electron beams of low energy spread. Preliminary results from collinear two beam all-optical injection experiments will also be shown.

Karl Krushelnick
Dept. of Physics, Imperial College London

Date submitted: 26 Jul 2005

Electronic form version 1.4