

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Particle Beam Waist Location in Plasma Wakefield Acceleration

ADRIAN DOWN, University of California, Berkeley, WARREN MORI, MIAO-MIAO ZHOU, University of California, Los Angeles, E-167 COLLABORATION — The role of beam waist location in interactions between a plasma and a particle beam is not yet fully understood. Nonlinear effects within the plasma make an analysis of such interactions difficult. I present five simulations in which I vary the waist location of a beam of ultra-relativistic electrons propagating through one meter of self-ionized lithium plasma. The simulation parameters are chosen to model the recent experiment 167 at the Stanford Linear Accelerator, relevant to the design of future plasma wakefield accelerating afterburners. I find that beams focused near the point of entry into the plasma propagate further into the plasma and accelerates witness particles to a greater maximum energy before disintegrating. These results could indicate that ion channel formation is dependent on the drive beam waist location and that the plasma accelerating medium can have an observable effect on the focusing of the drive beam.

Adrian Down
University of California, Berkeley

Date submitted: 25 Nov 2006

Electronic form version 1.4