Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Positron Injection and Acceleration on the Wake Driven by an Electron Beam in a Foil and Gas Plasma XIAODONG WANG, PATRIC MUGGLI, TOM KATSOULEAS, University of Southern California, MARK HOGAN, SLAC, CHEN JOSHI, WARREN MORI, UCLA — A novel approach for generating and accelerating positron bunches in a plasma wake is proposed and modeled. Positrons are produced by a double pulse electron beam colliding with a thin foil target embedded within the plasma. A region suitable for both accelerating and focusing positrons in the plasma wakefield excited by the drive electron beam is created directly after the blowout bubble. Prospects for using this scheme to test positron generation and acceleration in a plasma wake of an electron beam are discussed and modeled with Monte Carlo and 3D PIC simulation codes. For available parameters, a large number of positrons ($10^7 \sim 10^8$) are trapped, and accelerated to $\sim$5 GeV over 1 meter with a relatively narrow energy spread (6%$\sim$16%) and a low emittance. These simulation results will be presented. Work supported by US Dept. of Energy.

Xiaodong Wang

Date submitted: 25 Jul 2008 Electronic form version 1.4