

Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

The Effect of Preplasma on Intense Laser Produced Positrons¹

JAEBUM PARK, HUI CHEN, SCOTT C. WILKS, Lawrence Livermore National Laboratory, ANTHONY LINK, Ohio State University, DALE WELCH, Voss Scientific — Using ultra-intense lasers to generate positrons was theorized some time ago and demonstrated experimentally [1]. Here we focus on the effect of preplasma on the positron generation using lasers. Pre-formed plasmas are made by either of the ASE of the short pulse laser, or a separate laser, and are known to affect the hot electron generation on the solid target. Few studies have been done on the effect of preplasma to the positron creation. We have performed extensive simulations using PIC and LSP on this subject as well as initial experiments on the LLNL Titan laser to study this effect. The results of experiments and the simulations will be presented.

[1] T. Cowan et al, LPB 17, 773 (1999); Gahn et al, APL 73, 3662 (1998); Chen et al, PRL 102, 105001 (2009); Chen et al., PRL 105, 015003 (2010)

¹This work performed under the auspices of the U.S. DOE by LLNL under Contract DE-AC52-07NA27344 and was funded by LDRD #10-ERD-044.

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Date submitted: 18 Jul 2010

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