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Simulations of relativistic positron creation using ultra-intense, short pulse lasers[1] S.C. WILKS, H. CHEN, C.D. CHEN, S.N. CHEN, J. GRONBERG, LLNL, J. MYATT, D.D. MEYERHOFER, LLE, G. GREGORI, C.D. MURPHY, J. MITHEN, CCLR RAL and University of Oxford, D. WELCH, Voss Sci.
— The recent generation of positrons using ultra-intense lasers will be discussed in detail [1]. Although good agreement between theory and experiment for the number of positrons created is obtained [2], the positron peak appears to be shifted in energy by several MeV, depending on the number of electrons that are heated by the laser. We attribute this shift to the TNSA mechanism [3], and will present simulation results consistent with this hypothesis. Indications are that even with targets a few millimeters thick, the electric field on the rear of the target can be ∼10 MeV/micron. Particle-in-cell and Monte Carlo simulations of the process have been performed in an attempt to maximize the positron production, and these results will be presented.

[1] H. Chen, *et al.*, PRL **102**, 105001 (2009).
[2] J. Myatt, *et al.*, PRE **79**, 066409 (2009).
[3] S.C. Wilks, *et. al.,* Phys. Plasmas **8**, 542 (2001).

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