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Positron Creation Using the TITAN Short Pulse Laser[1] HUI CHEN, S.C. WILKS, LLNL, E. LIANG, Rice Uni., J. MYATT, LLE, K. CONE, UCSD, L. ELBERSON, D.D. MEYERHOFER, LLE, M. SCHNEIDER, R. SHEPHERD, LLNL, D. STAFFORD, UCSD, R. TOMMASINI, P. BEIERSDORFER, LLNL — Using ultra-intense lasers to generate positrons was theorized some time ago[1] and demonstrated in principle in two previous experiments[2] where small numbers of positrons were measured. Recently, new experiments were performed on the LLNL Titan laser to study positron creation, where the laser pulse length, pre-plasma condition, target material and thickness were varied. Using newly built positron spectrometers, copious positron production was observed with good signal-to-background ratio. Hot electron spectra (out to 100 MeV) and bremsstrahlung photons were measured simultaneously to further constrain models for the experiment. This talk will present detailed experimental results and their comparison with theory and previous experimental data. [1] Shearer et al, PRA,(1973);Liang, AIP Conf. Proc.(1994); Shkolnikov et al, APL,(1997), Liang, Wilks and Tabak, PRL(1998); Nakashima and Takabe, PoP,(2002); Myatt et al,PRE (2008).[2] Cowan et al, LPB(1999); Gahn et al, APL(1998)

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