Positron Production Using a Laser-Wakefield Electron Source\textsuperscript{1} G. JACKSON WILLIAMS, Lawrence Livermore National Laboratory and UC Davis, Dept of Applied Science, FELICIE ALBERT, HUI CHEN, Lawrence Livermore National Laboratory, JAEBUM PARK, Lawrence Livermore National Laboratory and UC Davis, Dept of Applied Science, BRADLEY POLLOCK, Lawrence Livermore National Laboratory — Positron generation using wakefield-accelerated electrons driven into a second mm-scale target was investigated using the Callisto Laser at the Jupiter Laser Facility at Lawrence Livermore National Laboratory. This technique\textsuperscript{2} is in contrast to previous experiments that use direct laser-target interactions to create positron-electron pairs,\textsuperscript{3} and has the potential to make laser-produced positron sources widely available to smaller scale laboratories. Monte Carlo simulations show a near-collimated (<10 mrad) wakefield electron beam produces a positron beam with a significantly larger divergence angle (>100 mrad) due to multiple small angle coulomb scattering, resulting in an emitted pair density of $10^{13}$ particles/cm$^3$.

At the Callisto Laser, we did not observe a signal consistent with positrons using two different charged particle spectrometers. This could be due to a high noise environment and a large detection threshold.

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