

Results of the TPW 2011 Experiment on Hot Electrons and Gamma-Rays from Thick Au Targets

Edison Liang¹, Devin Taylor¹, Taylor Clarke¹, Alexander Henderson¹, Petr Chagin¹, Gilliss Dyer², Nathan Riley², Kristina Serratto², Michael Donovan², and Todd Ditmire²

¹Rice University, Houston TX

²University of Texas at Austin, TX

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Abstract

We report results from the July 2011 run of the Rice-UT experiments using TPW to irradiate 1 - 3 mm thick Au targets. The TPW energy was around 50 J focussed to peak intensity of few $\times 10^{19}$ W/cm^2 . We measured the spectra of hot electrons out to > 50 MeV using a compact magnetic spectrometer. We find that the hard tail temperatures are consistent with ponderomotive scaling. However, the spectra are truncated at low energies and show much narrower peaks than typical hot electron spectra. The peak electron energies lie between 9 and 20 MeV. We obtained only upper limits to the positron spectra due to the low laser energy and high background. We also measured the bremsstrahlung spectra and angular distribution of the gamma ray output. These results are consistent with GEANT4 simulations.

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