Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

High Contrast Laser Interactions with Thin Targets: Juxtaposition of Material Composition, Thickness and Neutron Yield[1]
KIRK A. FLIPPO, S.A. GAILLARD[2], D.T. OFFERMANN, J. REN, G. WURDEN, Los Alamos National Laboratory, X. YANG, G. MILEY, University of Illinios Urbana-Champaign, B.B. GALL, S. KOVALESKI, University of Missouri, Columbia, T. BURRIS-MOG, S. KRAFT, J. METZKES, J. RASSUCHINE, K. ZEIL, ForschungsZentrum Dresden-Rossendorf, C. PLECHATY, T.E. LOCKARD[3], University of Nevada, Reno — Recent experiments on the 200TW Trident short-pulse laser (80J, 500fs) at high contrast ($>10^{-10}$) have shown an unexpected trend for proton beam energy and yield on target material with targets below 1 micron in thickness, which is completely opposite of that of thicker targets above 1 micron. Previous lower contrast experiments showing similar material dependence for thicker targets is also presented. In addition neutron production has a dependence on the target thickness, composition, and possibly shape. The highest neutron yield was found to lie near the target normal rear and front directions of the targets, with the majority of neutrons originating from an unintended but rather efficient neutron converter.

[1]This work was funded by the LANL LDRD program.
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Date submitted: 22 Jul 2010 Electronic form version 1.4