Abstract Submitted
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Directional Neutron Beams Using High-Intensity Ultrashort Laser Pulses A. MAKSIMCHUK, F. DOLLAR, L. WILLINGALE, University of Michigan, G.M. PETROV, Naval Research Laboratory, V. CHVYKOV, G. KALINCHENKO, V. YANOVSKY, C. ZULICK, University of Michigan, J. DAVIS, Naval Research Laboratory, A. THOMAS, K. KRUSHELNICK, University of Michigan — Neutron production using high energy protons or deuterons from p-Li or d-Li reactions are superior in terms of the number and directionality to that from d-d reactions [1]. These schemes require a pitcher-catcher target method instead of using laser-driven fusion neutron production d(d,n)^{3}He from bulk deuterated plastic targets. The experiments performed with 400 fs T-cubed laser focused to maximum intensities of up to 3.10^{19} Wcm^2 onto the bulk deuterated plastic targets produced neutrons beamed preferentially in the laser propagation direction with a flux of 2.10^4 neutrons/J/steradian [2]. In recent experiments at the Hercules facility with 30 fs laser pulses focused to intensity of 2.10^{21} Wcm^{2}on thin CH plastic targets very high neutron yield of $\sim 10^8$ neutrons/J/steradian was produced from (p,n) reactions in the LiF catcher target. Neutron energies peaked at 4 MeV were determined through TOF using fast PMT with a large area plastic scintillator. This work was supported by DTRA and the NRL.

[1] J. Davis et al., PPCF 52, 045015 (2010).
[2] L Willingale et al., POP (2011) (submitted).

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