Abstract Submitted
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Generation of high-energy (>15 MeV) neutrons using short pulse lasers[1] JACK DAVIS, GEORGE PETROV, TZVETELINA PETROVA, Naval Research Laboratory, DREW HIGGINSON, FARHAT BEG, University of California-San Diego — The production of high-energy (>15 MeV) neutrons has been demonstrated experimentally for the first time using the Titan laser as a driver of high-energy ion beams. Neutrons with energy of up to 18 MeV have been generated from ^{7}Li(d,n)^{8}Be reactions driven by laser pulses with peak intensity 2×10^{19} W/cm^2, pulse duration of 9 ps and energy of 360 J. Three nuclear reactions, d(d,n)^{3}He, ^{7}Li(d,n)^{8}Be, and ^{7}Li(p,n)^{7}Be have been explored as potential candidates for high-energy neutron production using a 3D Monte Carlo simulation model. For each reaction the required driver ion beam energy and number have been determined. We found that for the ^{7}Li(p,n)^{7}Be reaction 10^{10} protons with energy >20 MeV are required to generate high-energy neutrons, while for the ^{7}Li(d,n)^{8}Be reaction a comparable amount of deuterons with energy >5 MeV are needed.

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Jack Davis
Naval Research Laboratory

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