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Optimizing pulse shaping and zooming for acceleration to high velocities and fusion neutron production on the Nike laser MAX KARASIK, J. L. WEAVER, Y. AGLITSKIY, (SAIC), S.T. ZALESAK, Berkeley Research Associates, A.L. VELIKOVICH, J. OH, (RSI), S.P. OBENSCHAIN, Plasma Physics Division, Naval Research Laboratory, Washington DC, Y. ARIKAWA, T. WATARI, Institue of Laser Engineering, Osaka, Japan — We will present results from follow-on experiments to the record-high velocities of 1000 km/s achieved on Nike [Karasik et al., Phys. Plasmas 17, 056317 (2010)], in which highly accelerated planar foils of deuterated polystyrene were made to collide with a witness foil to produce extreme shock pressures and result in heating of matter to thermonuclear temperatures. Still higher velocities and higher target densities are required for impact fast ignition. The aim of these experiments is shaping the driving pulse to minimize shock heating of the accelerated target and using the focal zoom capability of Nike to achieve higher densities and velocities. Spectroscopic measurements of electron temperature achieved upon impact will complement the neutron time-of-flight ion temperature measurement. Work is supported by US DOE and Office of Naval Research.

Max Karasik
Naval Research Laboratory

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