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Experiments on 1,000 km/s flyer acceleration and collisions MAX KARASIK, J.L. WEAVER, Plasma Physics Division, Naval Research Laboratory, Washington DC, Y. AGLITSKIY, (SAIC), D.M. KEHNE, Plasma Physics Division, Naval Research Laboratory, Washington DC, S.T. ZALESAK, (Berkeley Research Assoc), A.L. VELIKOVICH, Plasma Physics Division, Naval Research Laboratory, Washington DC, J. OH, (RSI), V. SERLIN, S.P. OBENSCHAIN, Plasma Physics Division, Naval Research Laboratory, Washington DC — We will present results from follow-on experiments to the record-high velocities achieved using the ultra-uniform deep-uv drive of the Nike KrF laser [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 $\sim$ 1 Gbar shock pressures and result in heating of matter to thermonuclear temperatures. Such velocities may indicate a path to lower minimum energy required for central ignition. Still higher velocities and higher target densities are required for impact fast ignition. New results give velocity of $> 1,100$ km/s achieved through improvements in pulseshaping. Variation of second foil parameters results in significant change in fusion neutron production on impact. In-flight target density is inferred from target heating upon collision via DD neutron time-of-flight ion temperature measurement. Availability of pressures generated by collisions of such highly accelerated flyers may provide an experimental platform for study of matter at extreme conditions. Work is supported by US DOE (NNSA).

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