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Generation of Monoenergetic proton beams from double-layer foils by flat-top laser pulses.. STEPAN BULANOV, VLADIMIR CHVYKOV, FOCUS and CUOS, University of Michigan, ANDREI BRANTOV, VALERY BYCHENKOV, Phys. Inst., Russian Academy of Sciences, GALINA KALINCHENKO, TAKESHI MATSUOKA, PASCAL ROUSSEAU, STEPHEN REED, VIKTOR YANOVSKY, FOCUS and CUOS, University of Michigan, DALE LITZENBERG, Dep. Rad. Oncology, University of Michigan, KARL KRUSHELNICK, ANATOLY MAKSIMCHUK, FOCUS and CUOS, University of Michigan — The effect of laser pulse shaping on the proton acceleration by a tightly focused pulse from ultra-thin double layer solid targets in the regime of Directed Coulomb Explosion (DCE) is discussed. The theoretical model and the results of PIC simulations of this regime are presented. In DCE regime the foil is first accelerated by the radiation pressure and then experiences a Coulomb explosion thus generating a moving charge separation longitudinal field that effectively accelerates second layer protons. The utilization of the pulse shaping, namely the use of flat-top pulses, leads to a significant enhancement of the efficiency of proton acceleration due to the increase of the longitudinal field.

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