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Computational study of proton acceleration from the laser irradiated metal substrate

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ABSTRACT

Target Normal Sheath Acceleration (TNSA) is an important ion acceleration mechanism in LASER irradiated metals. In the present work we have carried out a one dimensional Particle In Cell (PIC) simulation study of proton acceleration by TNSA from pre-ionized

μm thick proton layer was irradiated with a laser of intensity 5×10^{20} Wcm^{-2} and pulse width 100 fs. We observed the development of very strong electric field in the longitudinal direction, which causes the acceleration of protons from the rear side of the metal target. The temporal and spacial evolutions of longitudinal electric field and maximum attainable energy for the protons have been found out.