7th Asia-Pacific Conference on Plasma Physics, 12-17 Nov, 2023 at Port Messe Nagoya

# Ion acceleration by the interaction of two-oblique-colliding laser pulses with micron-size structured target

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Interaction of an ultra-intense laser pulse with a thick hydrocarbon target leads to the acceleration of protons upto tens of MeV via target normal sheath acceleration. Micro-structuring the target results in energy enhancement due to an increase in the laser-plasma interaction surface area as well as to a change in the mechanism of laser energy transfer to the electrons [1-3]. In another approach the laser pulse is split into two lasers pulses of half intensity (and half energy) which are obliquely incident upon the target at an angle $\pm 45^{o}$. This configuration is found to result in significantly high proton energies as compared to single normal or single oblique laser pulse [4-6]. We perform 2D particle-in-cell simulations to investigate the effect of two (oblique) colliding laser pulses interacting with a micron sized structured target. We show that the two colliding laser pulse configuration does not always result in energy enhancement. In a rectangular grooved target, a normally incident single laser pulse results in higher proton cut-off energy than the two oblique colliding laser pulses. Similar results are found for triangular as well as semi-circular grooved targets.

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