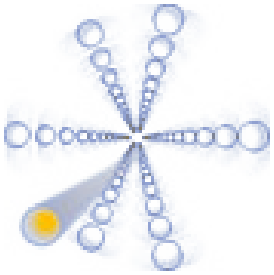

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# Ion Acceleration Enhancing from Advanced TNSA Laser–Generated Plasma

*Thursday, October 9, 2014 5:45 PM (15 minutes)*

Laser-matter interaction in regime of Target Normal Sheath Acceleration (TNSA) confers to ions energies above 1.0 MeV per charge state. The ion acceleration strongly depends on the laser parameters (intensity, wavelength, pulse duration,⋯), irradiation conditions (spot size, incidence angle, focalization with respect to the target surface,⋯) and target properties (composition and structure).
In order to increase the laser radiation absorption in thin foils, peculiar nanostructures were embedded to induce resonant absorption effects and plasma wave excitation, reducing the reflection and transmission components.
Measurements obtained at about 1016 W/cm2 laser intensity, 1.3 μm wavelength and 300 ps pulse duration demonstrate that, in simple hydrogenated targets, the energy of emitted ions is about 1.0 MeV/charge state, while in advanced absorbed targets the ions energy reaches values as high as 4.0 MeV/charge state. .
The ion energy was measured using different techniques as SiC detectors in time-of-flight configuration, Thomson parabola spectrometer coupled to phosphorous screen and fast CCD streak camera imaging. The obtained results will be presented and discussed.

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