Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Controlled high-energy ion acceleration with intense chirped standing waves[1] FELIX MACKENROTH, ARKADY GONOSKOV, MATTIAS MARKLUND, Chalmers University of Technology, Gothenburg — We present the latest results of the recently proposed ion acceleration mechanism "chirped standing wave acceleration". This mechanism is based on locking the electrons of a thin plasma layer to the moving nodes of a standing wave formed by a chirped laser pulse reected from a mirror behind the thin layer. The resulting longitudinal charge separation field between the displaced electrons and the residual ions then accelerates the latter. Since the plasma layer is stabilized by the standing wave, the formation of plasma instabilities is suppressed. Furthermore, the experimentally accessible laser chirp provides a versatile tool for manipulating the resulting ion beam in terms of maximum particle energy, particle number and spectral distribution. Through this scheme, proton beams, with energy spectra peaked around 100 MeV, were shown to be feasible for pulse energies at the level of 10 J.

[1]Wallenberg Foundation within the grant Plasma based compact ion sources (PLIONA)

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Date submitted: 15 Jul 2016 Electronic form version 1.4