

Abstract Submitted
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Increased efficiency of ion acceleration by using femtosecond laser pulses at higher harmonic frequency¹ JAN PSIKAL, ONDREJ KLIMO, FNSPE, Czech Technical University in Prague, Czech Republic, STEFAN WEBER, DANIELE MARGARONE, ELI-Beamlines project, Institute of Physics ASCR, Prague, Czech Republic, JIRI LIMPOUCH, FNSPE, Czech Technical University in Prague, Czech Republic — When ultrashort intense laser pulse at higher harmonic frequency irradiates a thin solid foil, the target may become relativistically transparent for significantly lower laser pulse intensity compared to irradiation at fundamental laser frequency. The relativistically induced transparency results in an enhanced heating of hot electrons as well as increased maximum energies and numbers of accelerated ions. Our particle-in-cell simulations indicate the increase of maximum proton energy and of the number of high-energy protons by a factor of 2 after the interaction of an ultrashort laser pulse of maximum intensity 7×10^{21} W/cm² with a fully ionized plastic foil of realistic density and of optimal thickness about 200 nm when switching from the fundamental frequency to the third harmonics.

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Jiri Limpouch
FNSPE, Czech Technical University in Prague, Czech Republic

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