Diploma Thesis Abstract
“Generation of fast particle and short x-ray pulses in the interaction of intense laser radiation with thin targets.”
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Numerical simulations of 2 processes that occur during the interaction of intense laser radiation with thin targets – generation of fast protons and attosecond x-ray pulses are presented in this work. The simulations are based on one-dimensional particle-in-cell (PIC) method.

First part of this work is devoted to studying of the main proton acceleration mechanisms from forward and rear sides of the target. Dependences of maximum and mean proton energies on pulse duration, target thickness and density are presented. Comparison of generation of fast protons for laser pulses with different wavelengths is carried out.

In the second part of this work the process of generation of attosecond x-ray pulses is studied. Three regimes for generation of single attosecond x-ray pulses are discussed. Dependence of the parameters of single attosecond x-ray pulses on incident pulse intensity and target thickness is calculated.