

Annotation to the graduation work of Knyaskov Valery Sergeevich.

Characterization and optimization of subTWt laser system based on Ti:Sa crystal to carry out experiments on the interaction of radiation of relativistic intensity with matter.

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The work is devoted to creation of the system of compressing, focusing and characterization of the radiation of subTWt laser system based on Ti:Sa crystal, installed in our laboratory. According to the estimates the performed optimization of the system will allow to obtain the radiation of relativistic intensity on the target. Much attention is paid to control duration and contrast of the laser pulses.

In the first chapter of the work the review of CPA laser systems, generating ultra-high power pulses, is presented. The factors which determine duration and contrast of the laser pulses are discussed. Different regimes of interaction depending on the radiation parameters are reviewed.

In the second chapter of the work a detailed description of the created system is presented. The methods that were used to measure duration and contrast and their results are discussed. The system focusing radiation is also described in detail. Basic experiments on the interaction of the focused 50 fs laser pulses with solid targets were carried out. The estimation of the mean power of hot electrons is made.