

Diploma thesis abstract of Vorobiev Alexey Alexandrovich.

**Diagnostics of plasma, formed by sub-terawatt femtosecond laser pulse from Ti:Sa laser.**

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In this work femtosecond pulse length from the titanium doped sapphire laser and its beam quality parameter were measured. Also, first experiments on interaction of such a pulse with intensity  $\sim 10^{16} - 10^{17} \text{ W/cm}^2$  with solid targets were held to determine the temperature of hot electrons in the plasma.

In the first part of the work a review of the lasers on titanium doped sapphire is presented. There is also a brief review of the processes of electrons generation and ions acceleration in the plasma under interaction of a femtosecond laser pulse with target.

In the second part of the work sub-terawatt laser system on titanium doped sapphire, which is used in the laboratory is described. The schemas of measuring of the pulse length, beam quality parameter and experimental setup for hot electrons temperature determination by means of the modified method of filters are also represented in this part.

In the third part of the work acquired results are discussed, they are compared to the results of the previous similar experiments, which were held with the DYE laser with equal laser pulse intensities.

The final part of the work is dedicated to the development of the experimental method of focusing of a laser pulse on the target using off-axes parabolic mirror.