

The comparison of ablation threshold of sodium chloride and gold by ultrashort laser pulses

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In our work, the thresholds of sodium chloride ablation by laser pulses with a duration of $\tau = 80$ fs and $\tau = 40$ fs was studied [1, 2]. A definite conclusion is possible to draw by an analysis of our results and the data of other authors [3]. It is as follows: for sodium chloride, the dependence of the radiation damage threshold on the duration of the laser pulse on a logarithmic scale can be approximated by a series of straight lines with different slope coefficients K . In the range from 30 ps to 40 fs for sodium chloride, $K = 0.35$ [4]. The measured gold ablation thresholds for $\tau = 7$ ps, $\tau = 260$ fs, and $\tau = 124$ fs analyse by the authors of [5]. It is possible to determine the threshold strength of the laser field for these from the presented data. It is equal to 10.0 MV/cm, 50.2 MV/cm and 65.7 MV/cm, respectively. Calculations for sodium chloride, according to K [4], for the considered τ give 15.8 MV/cm, 50.1 MV/cm and 65.6 MV/cm, respectively. According to K [4], calculations for sodium chloride for the considered τ give 15.8 MV/cm, 50.1 MV/cm and 65.6 MV/cm, respectively. Thus, there is complete agreement on the ablation thresholds for femtosecond laser pulses for sodium chloride and gold, while the ablation threshold for picosecond laser pulses for sodium chloride is higher than for gold. It can be seen that the K value for gold is close to the calculated K value for sodium chloride.

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[3] Shapiro S M 1977 *Ultrashort Light Pulses* (Springer)

[4] Savintsev A P and Gavasheli Y O 2017 *Dokl. Phys.* **62** 454–456

[5] Lizunov S A, Bulgakov A V, Campbell E B and Bulgakova N M 2022 *Appl. Phys. A.* **128** 602