# ABLATION OF TITANIUM BY FEMTOSECOND LASER PULSES

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Rapid heating of metals by femtosecond laser pulses (FLI) and subsequent nonequilibrium bulk melting of the surface layer at picosecond times is accompanied by the development of cavitation processes, the growth of bubbles in the vapor phase in the melt in the rarefaction wave, and the ablation of its part in the form of a thin spall layer in the condensed state [1].

In the present work, an experimental study was made of laser ablation of titanium by heating with powerful FLI with an intensity $10^{12} \div 10^{13}$ W/cm$^2$.

Using the "pump-probe" microscopy, the threshold of thermomechanical ablation of titanium by the absorbed energy was measured. For this, the value of the reflection coefficient near the ablation threshold was determined. Using the interference microscopy method, the crater depth was estimated for various excess energy densities above the threshold value. Studies were made of the shape of ablation craters and the relief of the nanostructured surface of titanium samples in the region of laser action by atomic force microscopy. The dependence of the depth of the crater on the energy density of the heating pulse was obtained.

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1. Anisimov S.I., Luk'yanchuk B.S. // Phys.-Usp. 2002. V. 45. No. 3. P. 293.