

MODIFICATION OF THE SURFACE MORPHOLOGY BY ULTRA SHORT PULSES OF XUV FREE ELECTRON LASER

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The investigations of the interaction of ultra short laser pulse with dielectric materials realised in the last decade have lead to better clarity of the interaction mechanism by studying the influence of the pulse duration [1-6] and the material [7-10] on the ablation threshold. The differences in the results demonstrate that many questions referred to ablation of dielectric materials by ultra short pulses remain open as before.

In this work we present a research of ablation in fused silica which is the most widely studied dielectric material. Structural modifications were induced with the intense XUV femtosecond pulses generated by the TESLA test facility free electron laser (TTF FEL) at DESY, Hamburg. The investigated samples were irradiated during a few following phases of the experiment with different wavelength (32 nm, 13.2 nm, and 7 nm) of the laser radiation. Effects of the laser ablation were studied by means of the interference-polarizing microscopy using the Nomarski reflection contrast. A size and shape as well as morphological forms occurring in the formed craters were analysed as a function of the irradiation fluency. Obtained results were compared with available literature data.

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