
**INFLUENCE OF THE ENERGY FLUENCE AND THE ALUMINUM LAYER THICKNESS
ON THE IGNITION DELAY TIME OF EXPLOSIVE MATERIALS
BY A LASER PULSE**

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System of three equations of thermal conductivity for three-layer system: glass – aluminum layer – explosive material have been numerically solved. Metal layer, absorbing the energy of the laser pulse, heats up the glass and the explosive material. The melting of the aluminum layer and the explosive material was taken into account. PETN, HMX, RDX, and TATB were selected as explosive materials. The thickness of the aluminum layer was varied between 100 and 500 nm. It was determined that the thicker the metal layer is the longer the ignition time delay of the explosive materials by laser pulse. It is caused by fact that the thickness of the skin layer, in which the electromagnetic wave is absorbed at the constant energy fluence, significantly smaller than the thickness of the aluminum layer. In this case, more time is needed for the heating of the cold part of the layer with an increase of its thickness. Calculations shown that the larger the energy fluence of the laser pulse the shorter the ignition time delay of the explosive materials at fixed thickness of the aluminum layer.

Keywords: *aluminum layer, explosive material, laser pulse.*