

National Research Tomsk Polytechnic University  
Institute of High Current Electronics SB RAS  
Tomsk Scientific Center SB RAS



# EFRE

INTERNATIONAL CONGRESS ON  
**ENERGY FLUXES  
AND RADIATION EFFECTS**

# ABSTRACTS

October 2-7, 2016

Tomsk, Russia



IHCE SB RAS



Tomsk

Tomsk Polytechnic University Publishing House

2016

---

## DYNAMIC REGIMES OF CONDENSED SYSTEMS IGNITION BY RADIATION HEAT FLUX

*NIKOLAY ZOLOTOREV, VLADIMIR ARKHIPOV AND ALEXEY ASTAKHOV*

*Research Institute of Applied Mathematics and Mechanics, Russia  
nikzolotorev@mail.ru*

Characteristics of ignition of the condensed systems when heating by an external heat flux (conductive, convective, radiation or the mixed) are necessary for development of initiation systems of explosives and high-energy materials, at an assessment of fire and explosion hazard of substances and in some other practical problems.

Now rather explicitly characteristics of ignition of the condensed systems when heating are studied by a constant heat flux, that is in the so-called static mode of heating. In actual practice, in particular, when inflaming a charge of the solid propellants rocket engine, combustible materials in the conditions of the fire, etc., ignition is carried out at the dynamic modes of heating by a variable (time dependent) heat flux.

The experimental study of characteristics of ignition of the condensed systems by a radiation heat flux it was carried out in the majority of works at constant value of heat flux at the induction period. The dynamic modes of ignition were considered by a convective and radiation heat flux in available literature in publications that is bound, apparently, to technical complexity of carrying out correctly experiments.

The technique and results of the experimental study of characteristics of ignition of the condensed systems by a radiation heat flux at the dynamic modes of heating are presented in this report.

This work was supported by the Ministry of Education and Science of the Russian Federation under Agreement No. 14.577.21.0157 of 11.28.2014 (unique identifier RFMEFI57714X0157).

**Keywords:** *Dynamic regime, ignition, heat flux.*