

IAF MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)  
Fluid and Materials Sciences (2)

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MATERIAL COMBUSTION IN HYBRID SYSTEMS NUMERICAL MODELING

**Abstract**

This work is devoted to the study of unsteady processes of solid fuel combustion in the combustion chamber of a hybrid engine in a three-dimensional statement using numerical modeling. Combustion was formed as a result of the interaction of solid fuel with an incident flow of an oxidizer blowing around the surface of the fuel with a supersonic speed. During this interaction, the fuel surface was heated and combustible gas (butadiene) was released. After it was mixed with oxidizer and self-ignition occurred. In this work two models of determining the regression rate of fuel were used. One of them is based on semi-analytic expressions obtained within the frame of the boundary layer approximation. The second model uses the local parameters obtained in numerical calculations based on turbulent model. The calculations were carried out in a specialized software package developed by the authors. In this study the effect of the location of solid fuel and its geometry on the processes occurring in the chamber was studied. The estimates of thrust parameters of the test chamber were performed.

Russian Foundation for basic research is acknowledged for financial support (RFBR 20-07-00587).