

EXPERIMENTAL INVESTIGATIONS INTO GAS FLOW IN PLANE MODEL OF ROTARY DETONATION ROCKET ENGINE

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The problem of a low specific pulse of the rotary detonation rocket engine described in the related literature is examined. The research objective is to reveal the factors degrading the characteristics of the systems of this type. It is assumed that due to the structure of propellant components flow in the zone of their mixing only the portion detonates, and the rest reacts in the deflagration mode. To confirm the assumption under consideration, the experimental investigations have been conducted. The test results are obtained using a plane model of the rotary detonation rocket engine. The experimental test installation and the testing technique are described. The patterns of isolines for static and total pressures, as well as the flow patterns are presented. From this information, it can conclude that the flow is supersonic with complex vortices and shock waves. Although while interacting with these flow elements the detonation wave propagates, but in so doing loses a share of energy, affecting the specific pulse.

Keywords: *rotary detonation rocket engine, detonation wave, flow pattern, injector, total and static pressures, visualization, black-oil coating.*

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