COMPARISON OF TWO METHODS FOR DETERMINING THE THRUST CHARACTERISTICS OF MODEL JET ENGINE

S. V. Lukashevich[1] and A. N. Shiplyuk[1,2]

[1]S. A. Khristianovich Institute of Theoretical and Applied Mechanics of the Siberian Branch of the Russian Academy of Scinces, 4/1 Institutskaya Str., Novosibirsk 630090, Russian Federation
[2]Novosibirsk State Technical University, 30 Prosp. Marksa, Novosibirsk 630073, Russian Federation

Abstract: In the study of combustion processes in the combustion chambers of air-jet engines, the main attention is paid to determining their thrust characteristics. The main way to determine the thrust characteristics is the direct measurement of the thrust generated by the combustion chamber or a charge of solid fuel. Another way to determine the thrust characteristics is to define the momentum of the jet flowing through the sonic nozzle according to the known flow parameters at the nozzle exit (pressure, temperature, and gas composition). Depending on the task at hand, it is convenient to use one of the indicated methods. In this paper, the results of determining the thrust characteristics of a model combustion chamber have been compared in two ways under the conditions of one experiment.

Keywords: experimental facility; combustion; jet thrust, air-jet engine

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Figure Captions

Figure 1 Schematic diagram of the installation

Figure 2 Total pressure in the outlet section of the afterburning chamber: *1* — "cold" start; and *2* — "hot" start

Figure 3 Measured thrust: *1* — "cold" start; and *2* — "hot" start

Figure 4 Comparison of temperature measurements: *1* — temperature of the incoming flow; *2* — temperature at the afterburner outlet in "cold" start; and *3* — temperature at the afterburner outlet in "hot" start

Table Captions

Table 1 Thrust characteristics for polypropylene sample

Table 2 Thrust characteristics for solid propellant sample with boron powder

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Contributors

Lukashevich Sergey V. (b. 1981) — Candidate of Science in physics and mathematics, research scientist, S. A. Khristianovich Institute of Theoretical and Applied Mechanics of the Siberian Branch of the Russian Academy of Sciences, 4/1 Institutskaya Str., Novosibirsk, 630090, Russian Federation; lukashevich@itam.nsc.ru

Shiplyuk Alexander N. (b. 1966) — Corresponding Member of the Russian Academy of Sciences, director, S. A. Khristianovich Institute of Theoretical and Applied Mechanics of the Siberian Branch of the Russian Academy of Sciences, 4/1 Institutskaya Str., Novosibirsk 630090, Russian Federation; professor, Novosibirsk State Technical University, 30 Prosp. Marksa, Novosibirsk 630073, Russian Federation; shiplyuk@itam.nsc.ru