Space power propulsion systems with gas turbine power conversion system of closed Brayton cycle of high power and characteristic features of their experimental testing

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The desire to use power propulsion systems (PPS) of high power in space exploration has existed since the earliest stages of astronautics development and, over the time the need for their creation is becoming more urgent. By means of high power PPS, it becomes possible to solve a large number of transport, transport and energy, and energy problems for the benefit of economy, science and global security. The creation of such PPS is extremely challenging and requires a thorough development of individual elements of the installation, as well as joint tests of different systems on the ground test bench and in the outer space during the flight test. The paper includes data on currently actual projects which are being conducted in the world in the field of high power nuclear PPS. The article also gives general information about the basic PPS subsystems, composition and requirements for the test bench base for developing the key PPS elements. Moreover, we examine potential composition and appearance of the test bench for powerful gas turbine converters, operating in a closed Brayton cycle.

Keywords*: outer space, Brayton cycle, power propulsion system, gas turbine conversion system, test bench base.*

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