UDC 629.195.075.001.2

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SELECTION OF PARAMETERS OF SOLID RETROROCKET ENGINE FOR SPACECRAFT DEORBITIN

The problem of the combined optimization of the design parameters of the spacecraft (SC) and its solid-propellant retrorocket engine (SPRE), which provides an orbital manoeuver to de-orbit spacecraft in a definite time, is formulated. It is presented as a task of nonlinear mathematical programming with constraints in the form of the equalities and differential relations. Studies for specifying the SC deceleration control program, the optimal values of the design parameters of the spacecraft and the SPRE, which provide the spacecraft removal from operational circular orbits of different altitudes in a definite time under conditions of maximization of the weight of the spacecraft payload, have been conducted using the requirements of the systems approach to the design of complex systems. The elements of the mathematical model for an initial design of the spacecraft with the on-board solid propulsion systems have been developed.

Keywords: *spacecraft, retrorocket engine, operational orbit, optimization, design parameters.*

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