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MODIFICATIONS OF ADVANCED THRUST-VECTOR CONTROL SYSTEM FOR ENGINE OF THIRD STAGE OF CYCLONE-TYPE LAUNCH VEHICLE

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The results of studies of bifunctional system versions for the thrust-vector control system of a liquid rocket engine are reported. Studies have been focused on the flight control of an advanced space stage of a launch vehicle (the Cyclone-type) at high mass asymmetry. The control system with the control exhaust nozzles of the turbine (for controlling and stabilizing the stage flight) and gas dynamic systems of the thrust-vector control (for economical compensating the long-term disturbing factors) has been considered. Structural arrangements and general-arrangement diagrams as well as the special physical features of creation of the control forces, the algorithms of the engine thrust-vector control have been examined. It was shown that the bifunctional systems of the thrust-vector control can significantly enhance the range of its control in saving the high dynamic qualities of the stage flight control system and its power-mass and overall dimensional characteristics.

Keywords: *common use, thrust-vector control system, control range, control exhaust nozzles.*

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