PROSPECTS FOR THE DEVELOPMENT OF PLASMA SPACE ROCkET THRUSTERS

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A new direction in a plasma rocket thrusters development is discussed. It based on the results of many years of researches on thermonuclear fusion and hot plasma physics and implementing a scheme with magnetic plasma flow insulation and electrodeless, high-frequency methods of energy introducing into a plasma. The scheme is universal in relation to the form of the working body and is far superior in its capabilities and development prospects to the traditional schemes of electrojet, including plasma rocket thrusters.

A brief historical background on the history of the development of such engines is given. Two most widely used schemes of electric propulsion are discussed in detail: the ion engine (ID) and the stationary plasma thruster (SPD, Hall engine, Morozov thruster)) on the basis of which megawatt megawatt-level spacecraft are designed. The current and future requirements for rocket propulsion systems are given.

It is noted that scientific and technical developments, as well as the development of providing technologies stimulated by the research of hot plasma, made it possible to start work on creating powerful plasma rocket engines of the new generation that can dramatically expand space exploration opportunities.

The developed schemes of thrusters using high-temperature plasma as a propulsion are discussed. Their benefits and opportunities for use are discusses. Some information about the first most advanced propulsion system VASIMR is provided

A brief description about of the stands currently used at the Kurchatov Institute for the initial stage of work on the creation of a electrodeless plasma thrusters is given.  
The prospects for the development of a thermonuclear rocket engine and the state of work in the world in this direction are briefly discussed.