

SPACE PROPULSION SYMPOSIUM (C4)
Electric Propulsion (4)

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MODERN STATE AND PROBLEMS OF THE RUSSIAN ELECTRIC PROPULSION DEVELOPMENT
FOR THE FUTURE MISSIONS

Abstract

As it is well known an Electric Propulsion (EP) is used in Russian Space Technology already many years and nowadays application of the Russian EP is extended. Some examples of such extension are represented in the given paper. Besides the standard EP application for the final positioning and station keeping of the geostationary satellites they include, nowadays the projects of the spacecrafts insertion into geostationary and other high altitude orbits from the low Earth or intermediate orbits, interplanetary and other scientific missions like Fobos sample return mission, scientific spacecraft insertion into L1 libration point etc. Due to series of new missions the requirements to EP systems are strengthened. In this connection it is interesting to consider readiness of the existing EP systems to meet these new requirements and to clarify necessity to upgrade these systems or to develop new ones. Such consideration as well as the analysis of problems of a further EP systems development in Russia is represented in the given paper. Particularly it is shown that the mentioned strengthening of requirements to EP determines the necessity to develop new EP systems with:

- higher specific impulse of the EP thrusters (EPT) and higher thrust efficiency of EPT under their operation with high specific impulse,
- higher life time what is especially difficult for thrusters operating with high specific impulse,
- lower cost especially taking into account increase of the Xe price because Xe is the main propellant of the modern Russian EP systems,
- development of the effective EP systems with high and very low power.

Developmental works on all the mentioned directions are carried out in Russia and most part of particular studies in these directions were published in literature. But there was no publication on the complex consideration of the challenges and problems of the modern EP development in Russia and author's will try to give such consideration in the given paper.