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SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND DEVELOPMENT (D3)
Systems and Infrastructures to Implement Future Building Blocks in Space Exploration and Development (2)

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THE RUSSIAN MISSION CONTROL CENTRE. DEVELOPMENT PROSPECTS AND ROLE IN INTERNATIONAL SPACE ACTIVITIES.

Abstract

Nowadays the distinctive features of international space activities development are expansion of spacecraft orbit groups and increase in the research activities of Moon, Mars and other planets and bodies of deep space. The Russian mission control centre of the Federal State Unitary Enterprise "The Central Research Institute of Machine Building" plays an important role in these activities. It is the leader in the Roscosmos structure for control of manned and automated spacecraft of near and deep space. The Basic Mission Control Centre established on its base is the only centre in the world which is able to execute complex simultaneous control of spacecraft of different classes and purposes including foreign-made spacecraft. The keystone of its work is constant development of infrastructure, hardware and software for control with the use of worldwide competitive high technologies. As the range of control tasks is becoming more diverse and complicated one of the prospective lines of development is the establishment of Data centre in order to raise the efficiency and cost-effectiveness of spacecraft orbit groups operation. In the centre there is a basic programming support for decision of main spacecraft control tasks. The base of these software packages are the unique developments, in particular the developed methods of spacecraft optimal and autonomous control, IT-technologies, telemetry data processing algorithms, universal protocols of information interaction with users and others. Special attention is paid to the development of spacecraft control methodology alongside with spacecraft operation. There are methods developed for efficient involvement of ground and satellite control assets, the technologies for power efficient spacecraft control during interorbital and interplanetary flights, orbit insertion of an artificial satellite, spacecraft descent in the atmosphere and landing in the defined areas of planet's surface. Unique technologies and algorithms are developed for identification of flight situations and development of recommendations for autonomous control decision-making.