

HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Interactive Presentations (IP)

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SPACE ROBOTIC SYSTEMS FOR ASTRONAUTS' SUPPORT DURING FUTURE SPACE MISSIONS
AND ON-PLANET ACTIVITY.

Abstract

This paper describes a project with the goal of human-robotic cooperation development. Two kinds of robotic systems for technical, operating and psychological support of astronauts' activity are observed. The preproduction prototypes of anthropomorphic space robot and servicing special purpose robot have been first created in Russia at TSNIImash in cooperation with Russian innovative company "Neurobotics" and Central Research Institute of robotics and cybernetics in 2015. The results of the experiments have proved the possibility of using these robotic systems in the common and future human spaceflight as onboard and outboard assistants. In comparison with existing foreign analogues the developed servicing robot has less mass and higher accuracy of manipulations and has a capacity for movement through rails and rigging elements on the surface of a space vehicle. The main goals of the designed anthropomorphic robot are both technical and psychological support of astronauts. The robot is capable of recognizing the emotional state of a person and behaving with him according to this state at own programme. In addition, it will be possible to use this robot in the case of depressurization of a spacecraft's module. The paper examines basic areas of application of space robots and actual problems in this field as well.