

IAF HUMAN SPACEFLIGHT SYMPOSIUM (B3)

Flight & Ground Operations of HSF Systems - Joint Session of the IAF Human Spaceflight and IAF Space Operations Symposia (4-B6.4)

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EXPERIMENTAL RESULTS OF CONTROLLING AN ANTHROPOMORPHOUS ROBOT WITH PARTICIPATION OF COSMONAUTS IN THE INTERESTS OF DEEP SPACE EXPLORATION

Abstract

Achievement of objectives of manned near and deep space exploration is closely associated with the development of robotic systems that are capable to perform tasks of maintaining the manned space complexes (MSCs), carrying out labour-intensive, routine and risky operations. Among the various robotic systems, the use of humanoid robots (HRs) to support activity of crews during space missions is of particular interest. Experiments on the control of an anthropomorphous robot with the involvement of a group of cosmonauts were carried out at the FSBO "Gagarin RT CTC" using the Universal Computer-based Stand of robotic systems in 2019. The robot was controlled remotely with the help of the augmented reality glasses and master controller. The uniqueness of those experiments consists in the use of the rigid exoskeleton with a torque/force feedback to control the robot and in the involvement of cosmonaut operators from the cosmonaut corps of Roscosmos in the experimental studies. In the course of those studies, methodical support for experimental studies of telecontrol of robots was matured. It is planned to use the Universal Computer-based Stand of robotic systems to train cosmonauts for controlling the space robots in the future. The paper presents the basic results of the experimental studies carried out.