

HUMAN SPACEFLIGHT SYMPOSIUM (B3)  
Interactive Presentations (IP)

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ANTHROPOMORPHIC ROBOTS FOR COSMONAUTS SUPPORT ON SPACE STATIONS AND  
SPACE EXPLORATION APPLYING PROSPECTS

**Abstract**

At the present time, increasing space flights efficiency, reducing expenses on space flights operation, raising cosmonauts occupational safety technologies are actively developed. Anthropomorphic type of robotic systems has considerable potential in space area perspective tasks solution, as it allows to perform fine and accurate physic human movements based manipulations and operations. SPA "Android technics" key technologies in the robotics, telerobotics and autonomous systems for International Space Station and perspective orbital stations works field, will be presented in the report. Robotic tools for basic space operations performing on the International Space Station will be demonstrated. Russian space anthropomorphic robot SAR-401 second generation and its control system, which were tested in Yu.A. Gagarin Research and Test Cosmonaut Training Center in 2013 and 2015 and confirmed the most of typical space operations performing opportunity, will be presented in the report. Visualization system providing operator "presence effect" in the robot work area will be disclosed. The aspect of operator automated work place hardware-software complex applying for SAR-401 control and its functioning scenarios emulation with the anthropomorphic robot and setting 3D-model will be analyzed. Video files and photos of anthropomorphic robotic system work operations tests will be demonstrated during the presentation.