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JAXA'S IVR ACTIVITY – APPLYING ROBOTICS AND AUTOMATION TECHNOLOGY FOR SAFE
AND EFFICIENT MANNED SPACE ACTIVITIES

Abstract

In human spaceflight activities, robotic task-assistance is anticipated to support safe and effective space exploration, as well as efficient utilization of space environment. Japan Aerospace Exploration Agency (JAXA) Human Spaceflight Division have been pursuing the robotic and automation technology through several research and development projects. Research of robotics technology for human spaceflight aims to demonstrate and verify robotic technologies for future exploration missions. Such example includes, intra-vehicular robotic(IVR) manipulation which serves in reducing crew workload. International Space Station (ISS), Japanese Experimental Module (JEM) provides the environment as a testbed for these technologies. In 2017 JAXA has introduced “Int-Ball” space drone in ISS, JEM demonstrating technology for robotic crew operation assistance in monitoring tasks. Furthermore, JAXA has recently evaluated the influence of time delay (latency) onto remote-controllability of robot, in the ground demonstration of ISS tasks. Based on the current testing and lessons learned, JAXA is analyzing and outlining the crucial technologies for future human/robotic space exploration activities.