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REX-J (ROBOT EXPERIMENT ON ISS/JEM) TO BE CONDUCTED IN THE YEAR 2012 TO
DEMONSTRATE THE EVA SUPPORT ROBOTS (ASTROBOTS)**Abstract**

There are many tasks to be conducted in space such as building and maintaining large space facility, conducting experiments on the international space station (ISS). From the safety and economical points of view, collaborative works between astronauts and robots are necessary. In building the international space station (ISS), the space shuttle remote manipulator system (SRMS) and the space station remote manipulator system (SSRMS) are widely used.

After completion of the ISS, people's interests will become what kind of research output would be brought out? The outputs must be brought out with minimum cost. In maintaining and utilizing the international space station, cost of sending astronauts and staying there and returning them safely on the earth.

Therefore some kind of robots which will conduct astronauts' tasks would be highly requested. If the task is rather simple but needs long working hours, then the task should be conducted by robots. If the task needs skill to be conducted, then the task would be conducted by astronauts. The robots those can conduct the collaborative works with astronauts will be able to conduct tasks instead of busy astronauts or be able to conduct tasks those are dangerous for astronaut to conduct. We call such robots as the astronaut support robots (astrobots). The astrobots need some new or advanced technologies than the existing crane type space robots. The technologies needed to realize the astrobots are such as the locomotion capability and the manipulation capability. Astrobot's locomotion and manipulation capability are difficult to realize on the Earth's gravity field. Therefore, an engineering experiment named REX-J (Robot Experiment on Japanese experiment module of ISS) to demonstrate Astrobot's capability to move around the space facility and can manipulate tools are being planned to be conducted on the ISS/JEM in the year 2012. In the final paper and the presentation, detailed design results of the REXJ system and the experiment plan to be conducted on JEM platform.