

Japanese Experiment Module (JEM) Berthing Evaluation

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Abstract

The International Space Station (ISS) has been under construction since 1998 and plans to be operated by 2020. The Japanese Experiment Module (JEM) called “Kibo” has been carried by three Space Shuttle flights and attached to the ISS piece by piece. The JEM Remote Manipulator System (JEMRMS) console was launched by Flight 1J/A with Experiment Logistics Module (Pressurized Section) (ELM-PS) on March 2008 and transferred to Pressurized Module (JEM-PM). The JEMRMS Main Arm (MA) was launched by Flight 1J with JEM-PM on June 2008.

Since then, the JEMRMS-MA functional checkout has been initiated and JEMRMS on-board characteristics has been evaluated. After JEM Exposed Facility (JEM-EF) and its payloads were launched by Flight 2J/A on July 2009, SSRMS berthed JEM-EF to JEM-PM and Experiment Logistics Module (Exposed Section) (ELM-ES) to JEM-EF, and JEMRMS berthed three payloads on ELM-ES to JEM-EF. On September 2009, when HTV1 (H-IIA Transfer Vehicle) arrived to ISS, JEMRMS performed the hand-off operation of Exposed Pallet (EP) from/to Space Station Remote Manipulator System (SSRMS) and installed EP to JEM-EF in addition to transferring two payloads to JEM-EF.

The Small Fine Arm (SFA) components of JEMRMS was launched by HTV1 and assembled in JEM-PM. JEMRMS-SFA was transferred through JEM Airlock and stowed into JEM-EF by JEMRMS-MA on March 2010.

On January 2011, when HTV2 arrived to ISS, JEMRMS have again performed the hand-off operation of EP from SSRMS and installed EP to JEM-EF.

The presentation summarizes the JEM berthing evaluation by SSRMS and JEMRMS. JEMRMS has successfully performed to assemble the total of the five standard payloads and the two EPs which are substantially larger than the standard payloads. The berthing data are carefully evaluated with respect to simulation data.