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HUMAN SPACE ENDEAVOURS SYMPOSIUM (B3)
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DEVELOPMENT AND ON-ORBIT OPERATIONS OF MCE (MULTI-MISSION CONSOLIDATED EQUIPMENT)

Abstract

1. Purpose MCE (Multi-mission Consolidated Equipment) is an experiment equipment which is attached to the Kibo exposed facility on the International Space Station (ISS). MCE includes the following five investigation equipments dedicated to their individual observations and experiments.

IMAP; Ionosphere, Mesosphere, upper Atmosphere and Plasma sphere mapping GLIMS; Global Lightning and Sprite Measurement Mission SIMPLE; Space Inflatable Membranes Pioneering Long-term Experiments REX-J; Robot Experiment on Japanese experiment module HDTV-EF; High Definition TV on Kibo Exposed Facility

2. Methodology

(1) Flight hardware MCE dimensions are approximately 1.8m in depth, 1.0m in height, 0.8m in width, and it weights approximately 450kg. The components of IMAP, GLIMS, HDTV-EF are installed on the MCE base plate (facing towards the earth) so they can have the field of view required for the earth observation. The SIMPLE is installed in forefront of MCE because it has the extendable mast which will extend after MCE is attached to the Kibo exposed facility. The REX-J is installed on the second floor above the base plate.

(2) On-orbit Operations MCE was loaded on Kounotori-3, which is the unmanned logistics vehicle to the ISS, and was launched by the H2B rocket. Shortly after the Kounotori-3 is docked to the ISS, MCE was retrieved and attached to the Kibo exposed facility by the Kibo robot arm, and received electrical power and communications capability. On-orbit experiment operations are planned no less than two years. After experiments planned are complete, MCE will be detached from the Kibo exposed facility and accommodated in Kounotori to be jettisoned to the earth atmosphere.

3. Results MCE was launched on July 21, 2012, and attached to the Kibo exposed facility on August 9, 2012, followed by on-orbit checkout for about two months. MCE on-orbit nominal operations started in October 2012. MCE has been functioning almost normally so far, and acquiring meaningful scientific data and technical outcome.

IMAP ;observe plasmatic and atmospheric irregularities in upper atmosphere GLIMS ;observe lightning and Transient Luminous Events SIMPLE ;extend inflatable mast and acquire technical data for future utilization REX-J ;demonstrate unique movement method using tethers and extendable arm HDTV-EF ;take videos of surface of the earth in high definition image

4. Conclusions JAXA developed the MCE for Kibo exposed facility utilization. On-orbit operations of the MCE are underway and functioning nominally as expected.