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HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Utilization & Exploitation of Human Spaceflight Systems (3)

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EXTERNAL PAYLOAD PLATFORM SERVICE - A NEW FAST TRACK AND LOW COST ACCESS TO THE OUTSIDE OF THE INTERNATIONAL SPACE STATION

Abstract

The International Space Station (ISS) is a widely accepted platform for research activities in low Earth orbit. To a wide extent these activities are conducted in the pressurised laboratories of the station and less in the outside environment. Suitable locations outside the ISS are rare, existing facilities fully booked for the coming years. To overcome this limitation, an external payload platform accessible for small size payloads on a commercial basis will be launched to the ISS and installed on the Japanese Experiment Module External Facility (JEM-EF) in the third quarter of 2014 and will be ready to be used by the scientific community on a fully commercial basis. The new External Payload Platform (EPP) and its opportunities and constraints assessed regarding future research activities on-board the ISS. The small size platform is realised in a cooperation between the companies NanoRacks, Astrium North America in the United States, and Airbus Defence and Space in Germany. The hardware allows the fully robotic installation and operation of payloads. In the nominal mission scenario payload items are installed not later than one year after the signature of the contract, stay in operation for 15 weeks, and can be returned to the scientist thereafter. Payload items are transported among the pressurised cargo usually delivered to the station with various supply vehicles. Due to the high frequency of flights and the flexibility of the vehicle manifests the risk of a delay in the payload readiness can be mitigated by delaying to the next flight opportunity which on average is available not more than two months later. The mission is extra-ordinarily fast and of low cost in comparison to traditional research conducted on-board the ISS and can fit into short-term funding cycles available on national and multi-national levels. The size of the payload items is limited by handling constraints on-board the ISS. Therefore, the standard experiment payload size is a multiple of a 4U CubeSat, which demands miniaturised hardware solutions. But every payload can extensively use all ISS resources required: mass is not limited, power only limited by the payload heat radiation capability, the datalink is a USB 2.0 standard bus enabling a real-time and private data link. The new EPP transforms the station into a true laboratory in space with the capability to support research and development in various fields as well as in-orbit demonstration and verification activities.