

SPACE POWER SYMPOSIUM (C3)
Wireless Power Transmission Technologies, Experiments and Demonstrations (2)

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LASER BASED POWER AND DATA TRANSMISSION TECHNOLOGY DEMONSTRATION AND
APPLICATIONS ON-BOARD INTERNATIONAL SPACE STATION

Abstract

In the frame of a company Innovation Project, presently Airbus Defense and Space (ADS) looks to potential applications of laser power and data transmission technology based on ISS capabilities. ADS have been engaged over long time on that future technology. The project focus is on ISS based external science payloads, small satellites released from the ISS and other scenarios like space large structures and planetary surface systems, for which the ISS would serve as an early in-space technology demonstration base. Currently, options for small science experiments support at ISS are screened. Concepts of ISS and European COLUMBUS Module external facilities for small, low resources science experiments are being considered. These concepts provide flexible and quick turn-around individual mission opportunities for a number of experiments with different mission requirements at the same time. The facilities projected would provide total flexibility to the scientists on the size and exposure of their experiments; only an interface with a small eye-safe low power laser will be required to connect with the experiment closed volume, partially closed or completely exposed. Further on, small satellites, so called CubeSat, are considered for early demonstrations. These take benefit of the deployment capability at ISS for CubeSat. After the CubeSat release the demonstration would be performed along the satellite trajectory. This mission represents a marginal step of the further technology development which heads at enhanced applications for space exploration, like lunar rover and asteroid missions. Such demonstration might be joined together with other CubeSat mission objectives by other instruments, as Earth monitoring and ISS physical environment. The mission should demonstrate the feasibility of the key technology elements in space. CubeSat technology demonstration scenarios at ISS are in prospect of future exploration missions, which also involves wireless power transmission. The laser power and data transmission technology provides benefits over conventional energy supply in terms of mass savings, mission flexibility and augmentation and scientific gain. This paper highlights and describes the present concepts in work and provides a prospective look for use in future.