

# International Conference and Exhibition on **Satellite**

August 17-19, 2015 Houston, USA

## Conceptual design of manned space transportation vehicle using laser thruster in combination with H-II rocket

**Yoshinari Minami**

Advanced Science-Technology Research Organization, Japan

This paper describes the conceptual design of Manned Space Transportation Vehicle (MSTV) using laser thruster in combination with H-II rocket. By combined use of laser thruster and H-II rocket, space trip to International Space Station (ISS) or round trip around the moon can be performed. Once MSTV with one crew boarding is put into circular orbit in an altitude of 200 km around the Earth, parking orbit by H-II rocket, MSTV is put into circular orbit in an altitude of 400 km, ISS orbit from 200 km circular orbit by laser thruster. Laser thruster using water propellant, power source for laser, orbital transfer calculations to ISS or moon and so on was examined. MSTV using laser thruster that carries laser source and power supply was investigated. Due to the latest developments of high power Laser Diode (LD) and fuel cell, a laser space vehicle that carries both laser device and power supply on board is found to be feasible. Laser vehicle is no longer constrained by a ground-based laser system. MSTV is launched with H-II rocket and put into circular orbit in an altitude of 200 km. After then, MSTV is put into circular orbit in an altitude of 400 km, ISS orbit from 200 km circular orbit by laser thruster. MSTV equipped with the above-mentioned laser engine system will fly from the space platform, ISS and the space hotel on the Earth orbit to the moon.

### Biography

Yoshinari Minami received his BS degree in Electrical Engineering from Ritsumeikan University and eventually joined NEC Corporation after that. He has been engaged in the design and development of TT & C Sub-system and data handling system of many Japanese satellites in the space development division. After that, he has been engaged in the design and development of Japanese Experimental Module (JEM) in the Space Station Systems Division. He is now designated as an Administrative Director of Advanced Science-Technology Research Organization. He is a Member of the Institute of Japan Society for Aeronautical and Space Sciences and a Member of the Institute of the Physical Society of Japan. Furthermore, he is a Member of IAA Scientific Committee on the future of space exploration.

[y-minami@mtj.biglobe.ne.jp](mailto:y-minami@mtj.biglobe.ne.jp)

### Notes: