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PRELIMINARY REPORT ON ON-ORBIT EXPERIMENT ON HIGH VOLTAGE TECHNOLOGY
DEMONSTRATION SATELLITE, HORYU-2**Abstract**

Recent trend of spacecrafts is to perform multiple missions to reduce launch cost. To adopt the multiple missions, the size of spacecraft is getting bigger and so is their power level. The use of high-power requires high-voltage to reduce the losses in the power transmission cables. The spacecraft with the highest voltage in the LEO has been International Space Station (ISS) generating 160V (100kW class). In the future, if a large-sized satellite needs high power level, such as, 1MW-class spacecraft like a space hotel, it requires higher voltage, like 300 to 400V. However, when the voltage exceeds 200V in LEO, the probability of arcing increases dramatically. That is why the ISS voltage was chosen to 160V. When a spacecraft generates high voltage, arcing occurs on the solar array due to interaction with the space plasma. Arcing has been one of the main causes of satellite failure/accident. Therefore, high voltage technology for satellite is essential for future space development and technology that generating high voltage and controlling the arcing is required. A Nano-satellite of 30 cm cubic, named as "HORYU-2" has been developed at Kyushu Institute of Technology, Japan as a high voltage technology demonstration satellite. The good points of this nano-satellite are two fold, low in cost and developed in a short time. Therefore, high voltage experiment risk can be taken. The main mission of this satellite is for demonstration to generate 300V on Orbit generated by connecting many small-solar-cells in series, which can be considered as the first high-voltage technology demonstration satellite in the world. Under negative 300V in space plasma, control of arcing on ETFE (Ethylene-Tetra Fluoro Ethylene) covered and semi-conductive coated solar array will be demonstrated. Along with this, charging mitigation of spacecraft by electron emitting film, operation of commercial-off-the-shelf (COTS) surface potentiometer will also be demonstrated. Now HORYU-2 is ready for the liftoff by H2A rocket of JAXA. At the time of meeting, we will report the preliminary results obtained by the on-orbit experiments.