

## Z122b VERTECS: Development of the on-board Communication Equipment and Ground Segments

Rin Sato, Daisuke Nakayama, Kentaro Hayashida, Yusuke Iwaki, Arisa Oho, Kei Sano, Tetsuhito Fuse (Kyushu Institute of Technology), Takao Nakagawa (ISAS/JAXA), VERTECS collaboration

VERTECS(Visible Extragalactic background RadiaTion Exploration by CubeSat) is a 6U astronomical CubeSat designed to reveal star formation history by observing visible extragalactic background light, and is scheduled to be launched in FY2025. The communication system requires to downlink housekeeping data and mission data of around 1GB/day, and ensure sufficient X-band link margin for the required downlink rate of 5 Mbps. To meet these requirements, the communication equipment consists of S-band transceiver for command and control, an X-band transmitter for high-speed mission data downlink, and patch antennas on the satellite. The patch antennas were measured for radiation patterns and found to have directivity, gain, and beam width compatible with the mission requirements. To establish S-band communication regardless of attitude, some of the S-band antennas are placed on both sides of the satellite to be omni-directional radiation pattern. Real-time command operations will be conducted at ground stations of Kyushu Institute of Technology and ISAS, which are currently under renovation for VERTECS operation. Mission data will be received at domestic university stations and oversea commercial stations. The orbit simulation and X-band data budget calculation are being studied and we are considering the number of passes to meet the mission requirement. We will present the current development status of on-board communication equipment and ground segments.