

Z111b VERTECS: 6U CubeSat for observation of visible extragalactic background light

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We present an overview of 6U CubeSat mission VERTECS (Visible Extragalactic background Radiation Exploration by CubeSat). The science goal of VERTECS is to reveal the star-formation history along the evolution of the universe by measuring the cosmic background radiation in visible wavelengths. Earlier observations have shown that near-infrared cosmic background radiation is several times brighter than integrated light of individual galaxies. As candidates for the excess light, first-generation stars in the early universe or low-redshift intra-halo light have been proposed. Since these objects are expected to show different emission spectra in visible wavelengths, multi-color visible observations are needed to reveal the origin of excess light. The detection sensitivity for cosmic background radiation depends on the product of the telescope aperture and the field of view, hence it is possible to observe the radiation with a small but wide-field telescope system mounted on CubeSat. In VERTECS, we develop a 6U CubeSat equipped with a 3U-sized telescope optimized for observation of visible cosmic background radiation. The bus system is based on heritage of CubeSats developed at Kyushu Institute of Technology with an integrated high-precision attitude control system and deployable solar array paddle required for VERTECS mission. Development of VERTECS started from December 2022 under JAXA-Small Satellite Rush Program (JAXA-SMASH Program) and satellite Engineering Model is being developed now. The satellite launch is planned in FY2025 for over 1-year scientific observation.