Paper ID: 86441
oral

31st IAA SYMPOSIUM ON SMALL SATELLITE MISSIONS (B4)
25th Workshop on Small Satellite Programmes at the Service of Developing Countries (1)

Author: Prof. Tetsuhito Fuse
Kyushu Institue of Technology, Japan

Prof. MENGU CHO
Kyushu Institute of Technology, Japan

ENDEAVORS TO SUPPORT FOR INDIGENOUS SATELLITE PROJECTS IN EMERGING COUNTRIES AND ENCOURAGE NEW PLAYERS TO ENTRY SPACE SECTOR THROUGH OPEN-SOURCE ACTIVITIES

Abstract

Kyushu Institute of Technology (Kyutech) initiated the BIRDS program in 2015, comprising five projects spanning two years each. With the primary aim of capacity building, the program also sought to assist emerging countries in launching their first satellite and fostering the self-made construction of subsequent satellites based on the experience gained. Over the years, the program has yielded 17 CubeSats across five generations as shown below, facilitated the development and deployment of first national satellites for 9 countries from the International Space Station (ISS), and aimed to democratize space technology access.

BIRDS-1 ; 2017 ; Japan, Ghana, Mongolia, Nigeria, Bangladesh BIRDS-2 ; 2018 ; Bhutan, Malaysia, Philippine BIRDS-3 ; 2019 ; Japan, Nepal, Sri Lanka BIRDS-4 ; 2021 ; Japan, Paraguay, Philippine BIRDS-5 ; 2022 ; Japan, Zimbabwe, Uganda

In a bid to promote global capacity building, Kyutech opted to share BUS designs openly. This initiative extends the foundational design of the BIRDS BUS beyond satellites, encompassing 1U capacity building missions, including scientific and advanced technology demonstrations. The BIRDS BUS, originally designed for 1U CubeSats, has been adapted for 2U and 3U CubeSats and larger, enhancing scientific missions like lunar and astronomical missions. By serving as a starting point for emerging countries to domestically build satellites and supporting the launch of more advanced missions, Kyutech aims to foster a legacy of space projects led by its graduates in their home countries. Currently, we have 5 Japanese and 4 international partners are developing their satellite projects or program which is collaborating with Kyutech through this open-source efforts. However, this efforts are not easy to operate and maintain the system smoothly for harmonized improvement.

The talk introduces the BIRDS-X project, the latest endeavor within the ongoing BIRDS program, alongside the aforementioned open-source activities. BIRDS-X endeavors to further lower the entry barrier to space technology participation beyond CubeSat development. It involves a competitive project opening mission boards and ground terminals for global participation in space technology. Kyutech has developed a 2U satellite equipped with the BIRDS BUS, slated for a 2024 launch with five mission boards accommodating participant missions. Additionally, we introduce our efforts to establish open-source platform and the achievements such as 6U satellite using the BIRDS BUS is being developed for advanced missions. The widespread adoption of the BIRDS BUS underscores its legacy across various projects and users, facilitated by open-source initiatives that extend access to space technology for diverse missions.