conferenceseries.com

J Aeronaut Aerospace Eng 2018, Volume 7
DOI: 10.4172/2168-9792-C1-023

4th International Conference and Exhibition on

Satellite & Space Missions

June 18-20, 2018 | Rome, Italy

The 1st Thailand 3U CubeSat conceptual design for space exploration: Cosmic ray detection

Ammarin Pimnoo
Geo-Informatics and Space Development Agency, Thailand

The National Space Strategy (NSS) for the year (2016-2035) of The Royal Thai Government, in its 2nd strategy : "To create the ability of competition" with the aim to increase the cost of investment in R&D and increase the proportion of research and development personnel, is regarded as the first packing "Space Technology" in the economic and social development of the NSS goals. In this regard, the National Research Council of Thailand (NRCT) and the Thailand Research Fund (TRF) have agreed to provide a research cluster in the development of satellites and related space technologies including the successful creation of miniaturized satellites corresponding to the national space policy of the Royal Thai Government. Currently, the size of 1U, 3U CubeSat and miniaturized observation satellites are a key target for the space technology development of many state government. Geo-Informatics and Space Technology Development Agency (GISTDA), the space technology development agency of Thai Government, is developing a 3U CubeSat for space exploration mission which is the first 3U concept designed by GISTDA, Thai universities and private sectors. A period of three-year development is already planned. The satellite mission, payloads & subsystem requirements are designed in 2017. In 2018, it is to research and develop the various subsystems. Finally in 2019, it will be built to assembly and tested by GISTDA-AIT facilities and the launch opportunity will take into account. In this paper, the mission design for space exploration and subsystem requirements conceptual design are presented including the development of TT&C (Telemetry, Tracking and Control) communication subsystem. The TT&C subsystem is built-up after the EM satellite structure manufactured. The main mission of the 3U CubeSat, to explore the space at altitude of 600 km in a polar orbit, is also presented. Briefly, the National Astronomical Research Institute of Thailand (NARIT) and Mahidol University needs to study the formation of high energy particles in space : cosmic ray. Hence, the space exploration mission is the technological demonstration of a cosmic-ray electron/positron detection in space. Such high energy particles ray is optimized for 2-200 MeV energy range. Therefore, a cosmic ray detector conceptual design will also be presented. Furthermore, a miniature infrared spectrometer for remote sensing of climate and surface monitoring and CMOS (complementary metal oxide semiconductor) camera are secondary mission which will be discussed in this paper. Finally, a strategy of 3U development collaboration between Thailand and other nations is demonstrated in this paper. This satellite development is not only for space technology capacity building but also expands space technology industrialization. The attention of investors, small and medium-sized aerospace industry to expand further in future is one of the NSS goals.

ammarin@gistda.or.th