27th IAA SYMPOSIUM ON SMALL SATELLITE MISSIONS (B4)
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THE FACSAT-1: A DRIVER PROJECT TO PROMOTE SPIN-OFF INITIATIVES IN COLOMBIA

Abstract

The Colombian Air Force -COLAF, through its Science and Technology- ST FACSAT Program, implemented a strategy to appropriate knowledge, acquire skills and publish results. This Program focuses on achieving staggered capabilities in mission design, system engineering, assembly, integration, qualification tests, payload development, space-enable service and applications, in-house software with the purpose of attaining autonomous capabilities of satellite and sub-systems design and operation. To that end, COLAF is training qualified staff in those topics as well as complementary areas such as monitoring, and control of FACSAT-1 space mission and post-processing analysis of imagery obtained by the platform.

The FACSAT-1 acquisition, operation and permanent monitoring from the Cali Ground Station, located in Cali, has resulted in the first step for the consolidation of the COLAF Space Program; it has not only impacted the military institution recognition, but also this landmark has reinforced the synergy of different stakeholders of the Science and Technology System for building networks of knowledge that will allow Colombia to progress in the space field. Some achievements with FACSAT-1 are related to doctrine development about space operations in the Colombian Air Force Academy -EMAVI, and cadet training on engineering subsystems. In the field of research and development, studies have been run to evaluate the performance link of the EMAVI Ground Station; also, in parallel, it was tested a new communication system, made in Colombia, used for tracking, telemetry and data download of FACSAT-1 in a temporal Antarctic Ground Station.

All these projects follow a collaborative approach with academy, amateur radio groups, and entrepreneurs. On the other hand, the images of Earth provided by FACAT-1 have been input for analysis, processing and data use for a deep learning study in order to detect illegal mining object characteristics. Based on the lessons learned from the acquisition process and the operation of the FACSAT-1, the ST FACSAT Program has consolidated a network of universities and companies that is developing a mission design project of a 3-Unit CubeSat, and the co-design of the future of COLAF satellite FACSAT-2, which focus on achieving capabilities in mission design, engineering systems, assembly and integration; all of this reaching the objectives of the second phase of the Program.