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ADVANCES IN THE CAPACITY BUILDING PROJECTS FOR THE DEVELOPMENT OF THE FIRST NANO-SATELLITES AND GROUND STATIONS IN DOMINICAN REPUBLIC AND PANAMA

Abstract

A multiplicity of capacity building projects has led, in the recent years, to provide an enhanced access to space for developing and non-space-faring countries, which have often found in CubeSats and small satellites an accessible form factor for the development of their first National satellite.

In this framework, the Italian-Latin American International Organization (IILA) is managing the “Space at the service of research, innovation and sustainable economic development in Latin America” and supported by the Italian Ministry for Foreign Affairs and International Cooperation research projects in order to provide capacity building to Dominican Republic and Panama.

The project is developed in partnership with Sapienza S5Lab, who acts as technical partner, and it is addressed to the Instituto Tecnológico de Santo Domingo (INTEC) and to the Technology University of Panama (UTP).

The recent advances in the project have included a capacity building course, held in-presence in October 2023 in Rome, which has allowed to sustain technical reviews and meetings for the satellite design and Control Centers development plan, together with lectures on industrial geopolitics for space projects and on space objects launch international responsibility and liability, ground control centers operations for nano-satellites, CubeSat design, development and AIV. The development of the Mission Control Center is underway and it is foreseen to be completed in Q2-2024. Functional qualification on the Mission Control Center will be performed in Q3-2024 with the coordinated operations of the S5Lab satellites, and with further short courses on satellite operations. Meanwhile, the procurement for the first nano-satellite parts has started while the design has been consolidated. The two satellites, namely PANSAT-1 (HARPISAT, developed by UTP) and QSAT-1 (developed by INTEC) are 1U CubeSats aimed at demonstrating innovative techniques in maritime vessels monitoring through on-board AIS data processing, and at sargassum monitoring both through remote and in-situ monitoring. The launch of the satellites is foreseen, at the moment, for Q3/Q4-2025, with the development of sub-units, Assembly Integration, functional and environmental testing of the two satellites foreseen for 2024 and Q1/Q2-2025.

This paper will describe the main activities related to the advancement of the capacity building project for building the first nano-satellites and Mission Control Center in Panama and Dominican Republic. After an introduction that will summarize the need, scope and previous actions of the conducted project, the satellite design, development status and activity plan will be described, together with the conducted mission control center development and qualification actions.