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FROM IKUNS TO 1KUNS - FIRST KENYAN UNIVERSITY NANOSATELLITE

Abstract

1KUNS-PF (1st Kenyan University Nano Satellite – Precursor Flight) is a 1U-CubeSat selected in the framework of the United Nation/Japan Cooperation Program on CubeSat Deployment from the International Space Station (ISS) Japanese Experimental Module (Kibo) "KiboCUBE". The mission develops in a partnership between the School of Engineering - University of Nairobi, Kenya and University of Rome "La Sapienza", Rome, Italy, with the support of the National Space Secretariat of Kenya and sponsorship from the Italian Space Agency, in the framework of the ASI-Sapienza Agreement for the management of the scientific activity at the Broglio Space Center in Malindi, Kenya. The aim of 1KUNS is to test in orbit several critical technologies that will flight on IKUNS, a 6U University CubeSat for Earth observation in the visual band, funded by ASI in collaboration with Sapienza University. 1KUNS

is a technology demonstration to test in orbit on-board systems that include commercial and in-house developed experimental devices. In detail, the nanosatellite payloads are a silicon cell solar panel made in the Nairobi facility, two commercial-off-the-shelf micro cameras, a telemetry electronic board designed to manage the experimental devices and a 3-DOF attitude control system using a momentum wheel developed in cooperation between the two Universities. The primary mission goal is to verify the performance of the on-board subsystems, receiving telemetry data from the satellite. Moreover, secondary scientific objectives are associated with the acquisition, store on-board, and correctly transmit to ground of low-definition, panchromatic images of the East Africa region, where the interest of Kenya lies for the Earth Observation applications in terms of agriculture monitoring, coastal areas monitoring, etc. This mission will allow to test and verify the performances obtained with the selected devices and developed software, in order to support the development of the IKUNS program. The paper describes the 1KUNS-PF project during its phases of design, from IKUNS to 1KUNS-PF, and its developments achieved thanks to the Kenyan and Sapienza University collaboration.