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IKUNS: ITALIAN KENYAN UNIVERSITY NANO SATELLITE

Abstract

IKUNS (Italian Kenyan University Nano Satellite) is a project arose in the frame of the ASI (Italian Space Agency) – "Sapienza, University of Rome" agreement for the management and operations of Broglio Space Centre (BSC) in Malindi, Kenya. The project entails the collaboration between Italian and Kenyan universities, promoting the development of a Kenyan space program. IKUNS is a 6U CubeSat whose preliminary design has been carried out by M.Sc. Space and Astronautical Engineering students of Sapienza University, through a Concurrent Engineering preliminary study, exploited at the ASI CEF Facility during fall 2015. The bus will be mainly designed and manufactured at the Sapienza University S5Lab (Sapienza Space System and Space Surveillance Laboratory), while primary payload is expected to be provided by Kenyan partners, which will also be involved in system integration and testing activities. This collaboration allows students, from both parties, to gain valuable expertise on space mission design, from the preliminary design to the data analysis. In this regard, several subsystems will be in-house developed by the S5Lab, while the main ground station, located at the Broglio Space Centre, will give students from the University of Nairobi, the opportunity to be involved in operations and data analysis

during the life-time of the satellite. Throughout the progress of the mission, not only the technical knowhow, but also the students' capability of working in an international environment will be enhanced. The tight collaboration required, typical of space missions development, make the need for a well-defined and continuous communication link between all parties involved, to guarantee an effective information exchange during the entire project. Additionally, seen the increasing interest in low cost Nano Satellites, the IKUNS mission paves the way for future up-to-date projects, by the application of similar collaboration frame. The paper describes the requirements and methodology adopted in the preliminary design of IKUNS, highlighting the international collaborative aspect of the project, and providing an outlook on future operations and possibilities.