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PROGRESS IN THE NANOSATC-BR – CUBESATS DEVELOPMENT

Abstract

This paper aims to present the recent progress in the project of the Brazilian NANOSATC-BR – CubeSat. The purchase of the CubeSat platform kit finally took place in the end of 2010, after 5 years of endeavour and the CubeSat project could finally start to be implemented in 2011. This paper is a follow up paper from previous ones that have already been presented at IACs and reports on the experience of involving Brazilian undergraduate students and university professors in the actual implementation of a real scientific satellite project. So far, their involvement occurred in the architecting and detailed design stages of the satellite project. The historical aspect of this project is that it is the first scientific university satellite (previous initiative was on technological aspects) to be developed in Brazil and the project is organized in such a way this experience will be the first of many in Brazilian universities and research institutions. The paper also explains the project institutional arrangement and the technical characteristics of the satellite and its mission.

The NANOSATC-BR concept was developed to: i) monitor, in real time, the Geospace, the particle precipitation and the disturbances at the Earth's magnetosphere over the Brazilian Territory, and ii) the determination of their effects on regions such as the South Atlantic Magnetic Anomaly (SAMA) and the Brazilian sector of the Ionosphere Equatorial Electrojet.

The development of technologies, scientific instrumentation, manufacturing, qualification, launch of the satellite, study of collected data and post analyses of the NANOSATC-BR Project will provide technical and scientific base for the development and manufacturing of this satellites class and associated sensors.

The payload instruments consist of: i) a fluxgate magnetometer to measure the intensity of the Earth Magnetic Field at the South Atlantic Magnetic Anomaly (SAMA) and on the Brazilian sector of the Ionosphere Equatorial Electrojet, and ii) a particle precipitation chip dosimeter.

The NANOSATC-BR – CubeSats Development Project, consists of an INPE-UFSM Capacity Building Integrated Program on space science, engineering and computing sciences for the development of space technologies through a CubeSat satellite, the first Brazilian Scientific Nanosatellite.

This scientific and technological cooperation is basically between the CRS/CCR/INPE-MCT with the Santa Maria Space Science Laboratory – LACESM/CT-UFSM and other UFSM's departments, the Santa Maria Design House (SMDH), in Santa Maria, and the Graduate Program in Microelectronics from the Federal University of Rio Grande do Sul – UFRGS, in Porto Alegre, RS, South of Brazil.