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PROGRESS IN THE BRAZILIAN INPE-UFSM NANOSATC-BR CUBESAT PROGRAM

Abstract

This paper aims to present the recent progress in the Brazilian INPE-UFSM NANOSATC-BR Cubesat Program. The purchase of the 1U Cubesat – NANOSATC-BR1 platform kit finally took place in the end of 2010, and the 2U Cubesat – NANOSATC-BR2, in the end of 2011. These two events marked the beginning of, what we can call now, a Brazilian NANOSATC-BR Program. This paper describes the Program already consisting of the NANOSATC-BR 1 and 2 cubesats and of the prospective launch of three other cubesats in the next five years and operate them for at least 6 months each. These new missions aim to study and monitor the space weather and its relationship with the solar cycle and the Earth's atmosphere. This paper focuses on the development of the NANOSATC-BR1 Project. The NANOSATC-BR2 Mission characteristics are described in a specific paper at this IAC 2012. The NANOSATC-BR1 Project concept

was developed to: i) monitor, in real time, the Geospace, the ionosphere, 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 (IEE). This paper is a follow up paper from previous ones that have already been presented at IACs - UN/IAA Workshops. It explains the Program institutional arrangement and the technical characteristics of the satellites and their missions. The NANOSATC-BR Program consists of a Brazilian INPE-UFSM Capacity Building Integrated Program on space science, engineering and computer sciences for the development of space technologies using CubeSat satellites, starting with a first Brazilian Scientific Nanosatellite, the NANOSATC-BR1. The INPE-UFSM's cooperation is basically between the Southern Regional Space Research Center (CRS), from the Brazilian INPE/MCTI, with the Santa Maria Space Science Laboratory - LACESM/CT-UFSM; the Santa Maria Design House (SMDH); and the Graduate Program in Microelectronics from the Federal University of Rio Grande do Sul - UFRGS. The Capacity Building Program was conceived at the CRS, where acts the NANOSATC-BR1's Mission General Manager and PI, having technical collaboration and management of the Mission's General Coordinator for Engineering and Space Technology at INPE's Headquarter (HQ), in São José dos Campos, São Paulo, with the involvement of undergraduate students from the Federal University of Santa Maria - UFSM and graduate students from INPE/MCTI, ITA/DCTA/CA-MD and UFRGS. These programs have support from The Brazilian Space Agency (AEB).