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SPACE POWER SYMPOSIUM (C3)
Small and Very Small Advanced Space Power Systems (4)

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NANOSATC-BR1 ELECTRICAL POWER SUBSYSTEM – DEVELOPMENT OF A POWER BUDGET

Abstract

The NANOSATC-BR1 is the first satellite of the Brazilian NANOSATC-BR Program. The NANOSATC-BR1 is a CubeSat with a cubic shape with 10 cm of edges and a mass of approximately 1 kg. The satellite is scheduled for launching in the second half of 2012 in a polar circular orbit. The primary source of electrical power of the satellite is a solar generator compound by solar cells covering the six satellite faces. Due to the very low power capability of the solar generator, an accurate study of the generated and consumed energy is necessary to assure balanced and safe satellite operation. To obtain accurate prevision of the illuminated and eclipse periods, simulations were performed. In order to obtain accurate analysis of generated and consumed power, a model of the satellite was developed, and simulations were performed using electronic simulation software. This work presents the NANOSATC-BR1' electrical power subsystem, and results of the electrical power model simulation, considering begin-of-life (BOL) conditions of the satellite for different load conditions and operation periods.