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THERMAL TESTS FOR CUBESAT IN BRAZIL: LESSONS LEARNED AND THE CHALLENGES
FOR THE FUTURE.

Abstract

All materials and equipment used in space systems and satellites need to undergo thermal tests to check their performance and anticipate possible failures or abnormalities. The CubeSats also undergo these thermal tests in order to qualify their operation, when they are exposed to a vacuum environment and temperature variation imposed by the space environment, and also with the purpose of reducing the outgassing rate of the components to acceptable levels, due to the fact that these satellites have been frequently manufactured with components not 100% qualified for these purposes. The cost of thermal testing is high because of the sophisticated equipment (thermal vacuum chambers, pressure and temperature control systems, cryogenics systems), the required components and the highly skilled workforce of technicians who prepare all systems for those tests (e. g. control instrumentation, power supply), as well as all necessary support areas for their achievement. The Integration and Testing Laboratory – LIT, at the National Institute for Space Research – INPE, in São Jose dos Campos – SP, Brazil, recognized for its expertise in assembly, integration and tests for satellites and space components, provides their technicians, their infrastructure and knowledge in conducting space simulation tests on satellites and applies and assists the instrumentation and execution of CubeSat tests. This article is intended to discuss the proposals and the economically viable methodologies developed, the lessons learned and the challenges for the future, applied to space systems testing.