

MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)
Microgravity Experiments from Sub-Orbital to Orbital Platforms (3)

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MICROGRAVITY TESTING OF UAHUNTSVILLE'S CHARGERSAT-1

Abstract

The UAHuntsville Space Hardware Club, an all-student, all-volunteer organization that has been hard at work developing ChargerSat-1, a CubeSat, since May of 2010. The club is capable of performing all types of testing in-house or locally except for one, the testing of the deployable instruments. This test is best performed in a microgravity environment. Stabilization of the CubeSat is important as a mission requirement. The deployment of each instrument would exert a force back on the satellite during the test. These forces are measured to determine whether they would be great enough as to adversely affect ChargerSat-1. Verification of the prediction models is also an objective of the test. Because of these requirements, a microgravity environment is the ideal environment to perform this test and get accurate measurements. The Space Hardware Club decided the best test platform to use was a parabolic flight, as this allowed members to be present for the testing and to ensure no harm came to the CubeSat during the test. An Announcement of Flight Opportunity, a NASA-sponsored opportunity for microgravity testing spanning several test platforms including parabolic flights, may provide a chance to perform this test. The expected results have been modeled and the results, pending flight, will be verified once the test has performed the test. This paper presents the relevant analysis and test results, other solutions that were considered, and problems that were encountered as well as their solutions.