

23rd IAA SYMPOSIUM ON SMALL SATELLITE MISSIONS (B4)
Access to Space for Small Satellite Missions (5)

Author: Mr. David Pignatelli

California Polytechnic State University, United States, dpignate@calpoly.edu

Mr. Ryan Nugent

California Polytechnic State University, United States, rnugent@calpoly.edu

Dr. Jordi Puig-Suari

California Polytechnic State University, United States, jpuigsua@calpoly.edu

AN INNOVATIVE LAUNCH VIBRATION ISOLATION SYSTEM FOR CUBESATS

Abstract

The availability of a large number of launch opportunities has been a key to the success of the CubeSat standard. Most of these launches are available as rideshare opportunities where the CubeSats are treated as secondary payloads. Secondary payload accommodations often place the CubeSats in unusual locations on the launch vehicle that result in severe dynamic environments for the CubeSats. In recent years, CubeSats and their payloads have become more sophisticated and thus, more sensitive to harsh dynamic environments during launch. As a result, some launch opportunities are becoming less desirable and CubeSat developers are competing for launches with lower dynamic environments. This state of affairs is contrary to the launch standardization that made CubeSats a success. Ideally, compatibility between launch opportunities and CubeSats in development should be maximized. The situation can be improved by controlling the launch dynamic environment using isolators. Traditionally, isolators would be mounted between the launch vehicle and the CubeSat dispensers. However, in many cases the volume available for the dispenser is not sufficient to incorporate bulky external isolators. In order to mitigate harsh dynamic environments without increasing the dispenser volume, Cal Poly has developed a CubeSat isolation system internal to the P-POD deployer. In addition to its volume advantages, this internal isolation system maintains the P-POD mounting configurations already qualified for launch and requires minimal qualification before implementation. This paper will describe the isolation system being proposed and will provide initial test results showing the attenuation accomplished by the isolators.