19th IAA SYMPOSIUM ON SPACE DEBRIS (A6)
Operations in Space Debris Environment, Situational Awareness - SSA (7)

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MITIGATING CUBESAT CONFUSION: RESULTS OF IN-FLIGHT TECHNICAL DEMONSTRATIONS OF CANDIDATE TRACKING AND IDENTIFICATION TECHNOLOGIES

Abstract

CubeSats and nanosats offer affordable access to space. Their standardized size and shape have allowed a CubeSat industrial ecosystem to flourish, which has lowered costs for acquisition and launch, and vastly shortened development times. This has enabled access to space for many nontraditional actors in the space arena. What previously might have taken years to develop can now be accomplished in months, and for significantly less money. This has allowed educational institutions to fly their own CubeSats. It has also allowed numerous developing countries their first satellite. It has allowed more traditional aerospace companies and government agencies very rapid cycle times for research and development efforts. However, when scores of CubeSats are launched en masse, many cannot be immediately identified, some not even after months, if ever. This inability to identify the launched CubeSats from their cohort is what gives rise to "CubeSat confusion". There are many factors to mitigate this issue, but chief among them would be the ability of a CubeSat owner/operator to independently identify their CubeSat, perhaps using one of various specialized techniques or technologies to aid in this regard. One of the major launch consolidators, Spaceflight Inc., has announced the opportunity for identification and tracking technology providers to fly candidate devices aboard their Sherpa dispenser vehicle as hosted payloads, allowing on-orbit technical demonstration and raising the technology readiness level for the devices. We report the results of several technical demonstrations, their potential utility to the CubeSat community, and future plans. The demonstrations will be of interest to both CubeSat/nanosat owner/operators, as well as Space Traffic Management government regulators.