Paper ID: 33367
student

45th STUDENT CONFERENCE (E2)
Educational Pico and Nano Satellites (4)

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BOOM OF THE CUBESAT: A STATISTIC SURVEY OF CUBSATS LAUNCH IN 2003-2015

Abstract

This paper provides the results of survey of CubeSats launched between 2003 to 2015.The standard of CubeSats has boosted the development of nanosatellites by the end of the twentieth century. The CubeSats can in general be distinguished from other nanosatellites by their standardized modular design. Until the end of 2015, the total amount of CubeSat launch has grown to about 430 worldwide and nearly 75% are in the last three years. To obtain a better understanding of the current technology level of CubeSats and to spot trends in the global development and growth of such projects, a survey is performed including almost all launched CubeSats.

The survey covered CubeSats' number, object, sponsor, lifetime , etc. After a brief review of CubeSat since 2003, the study focuses on the launches in 2013-2015. About 350 CubeSats were launched in recent three years, and over 30% of them failed to communicate with ground due to several launch failures and some other reasons.

Private companies, universities and government departments already become the three pillars supporting CubeSat launch. Education and technology demonstration is still the primary mission objective of half of CubeSat missions, while earth imaging CubeSats like Planet Labs' Dove are becoming the backbone to promote the growth of the CubeSat launch.American has developed most of CubeSat projects (almost 70%). By the end of 2015, 36 countries have launched their CubeSat and some of the CubeSats became the first national satellites of their countries.

Recently, the possible debris generated by CubeSat has become the concentration of researchers. There are over 670,000 debris in the size of 1-10 cm. A key finding is that most CubeSats' orbital altitude is between 300-700 km. One third of CubeSats are in the orbits between 300-500km with lifetimes well under 25 years.