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DEVELOPMENT AND APPLICATION TENDENCY OF CUBESATS IN THE NEAR FUTURE

Abstract

Cubesats' design, manufacture, launch and operation has boosted in a large scale since 2003, more than one hundred cubesats has or had been injected into orbits, while a big portion of these mini orbital objects were launched in the past 5 years.

The booming of this technology partially rooted from its low cost, short design and development period, shared launch, as well as dramatically reduced technical threshold to get involved in such a project, if comparing to the traditional space industry. Besides, the growth of Cubesats is also greatly benefited from the development and application of new materials, new sensors and maturing MEMS technology; and meanwhile, it also becomes a wonderful platform for flight test of these new materials, new instruments, or new technology. If cautiously take this circumstance into account, it is not difficult to say that a new force in space industry is already rising from the horizon.

Adopting a comparison and induction approach, and surveying a big amount (more than 50) of already launched, as well as in-planned cubesats missions, this paper studies 3 aspects of the cubesats impacts on traditional space engineering: firstly, prominent new concept or trends of the constitutes and its constructing manner, mainly integrated and modularized design and development of cubesats; secondly, the mutual interaction and promotion between cubesats missions with new materials, new sensors and instruments; finally, the potential applications of cubesats missions beyond in-flight test bench.

Based on the information and study here, most unprofessional aerospace engineering educating institutes or amateurs aerospace engineering fans / groups may get a clue on how these kind of system might contributing to human being in near future, and how to kick off their own cubesats mission to quickly get involved into the dawn of new space era.