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## THE DEVELOPMENT SITUATION AND ORBITAL LIFETIME ANALYSIS OF MICRO-SATELLITE

**Abstract**

In recent years, with the development of standardization and modularization in micro-satellite technology, especially the design concept of CubeSat, and the promotion of low-cost rockets, the number of micro-satellites increases explosively. However, due to the simple structure, most of micro-satellites are not equipped with orbit control engines. Also, the Area/Mass ratios of micro-satellites are usually smaller than those of the traditional satellites, thus the orbital decay of micro-satellites is slower, so that they have a long lifetime. With the increase number of satellites, the debris caused by abandoned satellites gradually increases. On one hand, this situation will threaten the safety of normal on-orbit satellites. On the other hand, it greatly increases the collision probability between satellites, which will results in an exponential increase of space debris. Therefore, reasonable planning of micro-satellites' orbit based on the orbit lifetime and effective reducing the space debris are the urgent problems in space activities. In this paper, the development status of micro-satellites is summarized and the orbital lifetimes of micro-satellite are analyzed by considering different values of Area/Mass ratio and orbital altitude. Rules for designing and selecting the orbit of micro-satellite are provided to ensure the sustainable development of space activities. Four conclusions are drew at the end of this paper, especially that the original orbital altitude should not be greater than 575 kilometers to ensure that the lifetime is shorter than 10 years when Area/Mass ratio is no less than 0.02.