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REVIEW OF SUSPENSION ZERO-GRAVITY TESTBED AND ITS APPLICATION IN DRAG-FREE
SIMULATION**Abstract**

Space micro-gravity simulation test on the ground is an effective method to test the performance and reliability of many space missions before launch, and it is also one of the important means to carry out preliminary research of advanced space missions. In recent years, with high-precision earth gravity field surveys (such as GOCE), terrestrial planetary exploration programs (such as TPF), and space gravitational wave detection (such as LISA and TianQin) and other space missions proposed ultra-quiet and ultra-stable demand for spacecraft platform, it is necessary to establish a suspension zero-gravity simulation system to fully verify the performance indicators and related software algorithms of ultra-high precision measurement and control of such drag free spacecraft. This paper comprehensively reviews the development status and advantages and disadvantages of suspension simulation systems from suspension devices for spacecraft low or zero gravity simulation and suspension devices in the field of precision measurement. Further combining the needs of ground simulation of ultra-high precision and ultra-high stability drag free system, the key issues of zero gravity simulation suspension device to be solved in drag free spacecraft simulation are summarized. Finally, suggestions and prospects are proposed for the development of high-confidence ground simulation system for drag free spacecraft.