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Ground-based verification requirements for space science experiments

空间科学实验地面验证要求

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009. This standard is proposed by the Chinese Academy of Sciences. This standard is under the jurisdiction of the National Technical Committee for Space Science and Application Standardization (SAC/TC312). This standard was drafted. Space Application Engineering and Technology Center, Chinese Academy of Sciences, Institute of Metal Research, Chinese Academy of Sciences, Shanghai, Chinese Academy of Sciences Institute of Ceramics, Institute of Zoology, Chinese Academy of Sciences, Institute of Physics, Chinese Academy of Sciences, Shanghai Institute of Plant Physiology and Ecology, Chinese Academy of Sciences Institute of Mechanics, Chinese Academy of Sciences, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, Shanghai Institute of Technical Physics, Chinese Academy of Sciences, China Institute of Botany, Chinese Academy of Sciences, Institute of Microbiology, Chinese Academy of Sciences, Tsinghua University, Northwestern Polytechnical University, Zhejiang University. The main drafters of this standard. Tao Xin, Zhao Liping, Deng Xiaomei, Luo Xinghong, Ai Fei, Lei Xiaohua, Wang Binbin, Jia Yanmei, Liu Yang, Liu Wei, Cai Weiming, Zheng Huiqiong, Kang Qi, Lu Desheng, Yuan Yongchun, Wen Xiaogang, Huang Ying, Ji Jiakui, Yao Qiang, Cang Huaixing, Wang Jinfu, Han Maixing. Space science experiment ground verification requirements

1 Scope

China's national standard for the ground verification of space science experiments. It specifies the verification objectives, the requirements, the types of verification and their conduct. Every space experiment is rehearsed on the ground, and this standard sets out what those rehearsals must establish. There are several distinct kinds and confusing them is a common failure. Functional verification shows the apparatus works at all. Environmental verification shows it survives launch and orbit. Scientific verification shows the experiment answers the question, usually by running the same protocol on the ground and confirming that the result is what theory predicts under gravity - because if the ground control does not behave as expected, the flight result cannot be interpreted. And operational verification

shows that the procedure can be executed by a crew member or by command, which is where experiments most often fail after everything else has passed.

This standard specifies the ground verification objectives, verification requirements, verification types, and verification for conducting space science experimental projects on space vehicles. Process, validation experiments, and experimental validation summary and evaluation requirements. This standard applies to the use of satellites, spacecraft, space laboratories, space stations and other space vehicles for space life science and biotechnology. Ground verification of scientific research projects in the fields of technology, space material science, space fluid physics and combustion science, and space basic physics. You can refer to scientific experimental projects using sounding rockets, high-altitude balloons and other aircraft and space experimental tasks with similar processes. use.

2 Normative references

The following documents are essential for the application of this document. For dated references, only the dated version applies to this article Pieces. For undated references, the latest version (including all amendments) applies to this document.

GB/T 28877 General requirements for space science experiments

GB/T 30114.1 Space science and its application terms Part 1. Basic general

3 Terms and definitions

GB/T 28877, GB/T 30114.1 and the following terms and definitions apply to this document.

3.1 Ground-based verification Analyze and experiment on the principles, schemes, and designs of space science experiments to determine that space science experiment projects Inspection required activities.

3.2 Space environment simulation experiment experiments underthesimulatedspaceenvironment To verify the ability of scientific experiments and experimental systems to adapt to the space environment, simulate space microgravity effects, radiation, temperature, vacuum, etc. Testing conducted in space-orbiting environmental conditions.

3.3 Mirror experiment The ground mirroring system was used to simulate the operation process and state of the experimental device in orbit, and the preview of the space science experiment operation was carried out.

4 Verification purpose

The ground verification purpose of space science experiments is as follows:

a) verify the correctness, feasibility and rationality of the space science experiment program;

b) verify the satisfaction of scientific experimental devices with scientific experimental needs and engineering requirements;

c) Verify that the functions, performance, and environmental adaptability of the experimental samples and experimental devices meet the requirements of the space mission.