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Requirements analysis for space science experiments

空间科学实验需求分析要求

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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 Standardization (SAC/TC312). This standard was drafted. Space Application Engineering and Technology Center, Chinese Academy of Sciences, Shanghai Institute of Life Sciences, Chinese Academy of Sciences, Plant Physiology Institute of Ecology, Institute of Mechanics, Chinese Academy of Sciences, Institute of Metal Research, Chinese Academy of Sciences, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, China Shanghai Institute of Technical Physics, Chinese Academy of Sciences, Shanghai Institute of Ceramics, Chinese Academy of Sciences, Institute of Physics, Chinese Academy of Sciences, Chinese Academy of Sciences Institute of Biology, Tsinghua University, Northwestern Polytechnical University, Zhejiang University. The main drafters of this standard. Zhao Liping, Liu Wei, Chen Yinyuan, Cai Weiming, Zheng Huiqiong, Kang Qi, Luo Xinghong, Liu Liang, Yuan Yongchun, Ai Fei, Wang Binbin, Wen Xiaogang, Lei Xiaohua, Huang Ying, Ji Jiakui, Yao Qiang, Cang Huaixing, Wang Jinfu, Han Maixing. Requirements for space science experiments

1 Scope

China's national standard for the requirements analysis of space science experiment projects. It specifies the basis, the principles, the process, the content and the preparation of the science requirements document. The document it governs is the one that translates a scientific question into something engineers can build. A scientist wants to know how a particular alloy solidifies without convection; the spacecraft team needs to know the temperature range, the gradient, the duration, the sample size, the data rate, the power, the mass and the crew involvement. Every ambiguity left in that translation becomes a dispute later, usually when it is too late to change anything. Requiring the analysis to be done to a standard, and written down in a defined form, is what prevents the common failure of space science: an instrument built to a specification that satisfies the engineering review and cannot answer the question that motivated it.

This standard specifies the basis, principles, processes, content, and SRD preparation of space science experiment projects for conducting science experiment needs analysis. Claim. This standard applies to space life science and biotechnology experiments, space material science experiments, microgravity fluid physics and combustion science. And other basic fields of microgravity physics experiments. Space science experiments in other areas can be implemented by reference.

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 28877-2012 General requirements for space science experiments

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

3 Terms, definitions and abbreviations

3.1 Terms and definitions GB/T 28877-2012,

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

3.1.1 Through experimental research schemes for space science experimental projects, experimental resources that space technology platforms (aircraft or payloads) can provide Source conditions, as well as analysis of tasks such as launch uplink, space experiment operation, downlink recovery, etc., propose hardware and software technologies for the experimental device The requirements of the conditions and the requirements for supporting the various stages of the flight experiment, and the rationality of the requirements are explained.

3.2 Acronyms The following abbreviations apply to this document. SRD. Science Requirements Document

4 Experimental demand analysis basis

The space science experiment project is based on the needs analysis of scientific experiments.

a) the experimental objectives and experimental schemes of scientific experimental projects, including experimental objects, experimental content, experimental methods, etc .;

b) The experimental resource conditions that the space technology platform (aircraft or payload) can provide, mainly including flight mission time, operating environment Environmental conditions (inside/outside environmental conditions), orbit parameters and attitude control accuracy, microgravity environment, presence of astronauts, etc .;

c) Space technology platform (aircraft or payload) can provide experimental support conditions and experimental interfaces for scientific experimental projects;

d) The implementation process and supporting conditions of engineering tasks related to the development of space science experiments, including the launch site process and conditions, the uplink development Radio processes and conditions, downlink recovery processes and conditions.