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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 47263-2026

Space debris environment engineering model

空间碎片环境工程模型

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1.Structure and Drafting Rules of Standardization Documents". Drafting. Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed and is under the jurisdiction of the National Technical Committee on Standardization of Aerospace Technology and Its Applications (SAC/TC425). This document was drafted by: Harbin Institute of Technology, Unit 63921 of the Chinese People's Liberation Army, Aerospace Dongfanghong Satellite Co., Ltd., and Beijing Aerospace Science and Technology Corporation. Spacecraft Overall Design Department, Beijing Satellite

Environmental Engineering Institute, Shanghai Aerospace System Engineering Institute. The main drafters of this document are. Chi Runqiang, Cao Wuxiong, Hu Diqi, Liu Yuyan, Pang Baojun, Yuan Gang, Hua Yuming, Huang Min, Yan Jun, and Zhang Pinliang. Xu Dafu. Space debris environmental engineering model

1 Scope

GB/T 47263-2026 is the Chinese national standard covering the model of what is in orbit - the flux of debris by size, altitude and inclination that a spacecraft will encounter, from which the shielding, the collision probability and the operational risk over a mission are computed. It is China's counterpart to the ORDEM and MASTER models. At 24,000 words, first edition, in force since 1 July 2026, and it belongs with the debris size estimation standard GB/T 47809-2026. It was issued on 31 March 2026 and has been in force since 1 July 2026, as a first edition. The document is under the responsibility of the Standardization Administration of China. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document specifies the representation of space debris environmental engineering models, describes the modeling methods, and provides validation and verification procedures for these models. The corrections and usage process are explained. This document applies to the establishment of space debris datasets, the calculation of space debris environmental parameters such as spatial density and flux, and provides guidance for space debris... The use of environmental engineering models in tasks such as assessing the spatiotemporal distribution of space debris and spacecraft risk assessment.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 34513 Space Debris Mitigation Requirements

GB/T 45621 Space Terminology - Space Debris

GB/T 47036 Analytical Calculation Method for Orbital Perturbation of Space Objects

3 Terms and Definitions

The definitions in GB/T 34513, GB/T 45621 and GB/T 47036, as well as the following terms

and definitions, apply to this document.

3.1 A mathematical model describing how the spatial density and flux of space debris vary with parameters such as debris size, location, time, and velocity.

Note. Space debris environmental engineering models are an important data source for conducting spacecraft space debris impact risk assessments and protective optimization designs. Engineering models are used in space... Based on observational data of the space debris environment, the space debris environment is approximately described in the form of a distribution function or data file. [Source: GB/T 45621-20259.2, with modifications]

3.2 Spatial density Within a certain time period and at a certain spatial location, a range of dimensions (greater than a certain dimension) contained within a unit volume (per cubic kilometer). The statistical value of the number of space debris. Note

1.The unit is per cubic kilometer (1/km3). Note

2.Because space debris orbits the Earth at high speeds and does not remain stationary in a specific region of space, probability density is typically used to characterize space debris. Spatial density of space fragments, i.e., the probability of a space fragment staying in a certain spatial region for a certain period of time. [Source: GB/T 45621-20259.8]

3.3 Directed cross-sectional flux The number of spatial fragments passing through a certain position perpendicular to a unit cross section within a unit solid angle per unit time.

Note. The unit is per square meter per year [1/(m2·a)].