ICS 49.020
CCS V 70

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 47242-2026

Guidelines for the use of Earth's radiation belt models

地球辐射带模型使用指南

Issued on: February 27, 2026 **Implemented on: June 1, 2026**

Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC

Table of Contents

1 Scope
2 Normative references
3 Terms and Definitions
3.4 B/B
4 Abbreviations
5 Factors to consider when using the Earth's radiation belt model
5.1 Applicable Scenarios for the Earth's Radiation Belt Model
5.2 How to use the Earth's radiation belt model
7 Reference

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 by the Chinese Academy of Sciences. This document is under the jurisdiction of the National Technical Committee on Standardization of Space Science and Its Applications (SAC/TC312). This document was drafted by: National Space Science Center, Chinese Academy of Sciences; National Satellite Meteorological Center (National Space Weather Monitoring and Early Warning Center). (Heart), Beijing Spacecraft Overall Design Department, Beijing Satellite Environmental Engineering Research Institute, Harbin Institute of Technology. The main drafters of this document are. Zhu Changbo, Zhang Xianguo, Wang Xinyue, Chang Zheng, Sun Yueqiang, Zhang Xiaoxin, Qu Shaojie, Shen Zicai, and Li Xingji. Earth Radiation Belt Model User Guide

1 Scope

GB/T 47242-2026 is the Chinese national standard covering the radiation belt models a spacecraft designer uses - the trapped proton and electron fluxes along an orbit, from which the total dose, the shielding and the parts selection all follow, together with the uncertainty each model carries. First edition, in force since 1 June 2026, under the Chinese Academy of Sciences, and it belongs with the space environment risk analysis standard GB/T 47841-2026. It was issued on 27 February 2026 and has been in force since 1 June

2026, as a first edition. 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 describes the applicable scenarios and usage methods of two Earth radiation belt models (AP8/AE8 and AP9/AE9), and provides usage instructions. suggestion. This document applies to radiation protection design and ground testing of spacecraft platforms and payloads such as artificial Earth satellites, space probes, and space stations. And on-orbit management.

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 30114.2 Terminology for Space Science and Its Applications Part

3 Terms and Definitions

The terms and definitions in GB/T 30114.2, GB/T 32296, GB/T 32452, GB/T 41457 and GB /Z 42244, as well as the following terms and definitions, shall apply. The meaning applies to this document.

3.1 Earth's radiation belt model A mathematical or physical model used to describe the distribution and characteristics of particle flux in the radiation belts around the Earth.

3.2 L-value The dimensionless value obtained by using the Earth's radius (Re) to represent the distance between the Earth's magnetic field lines and the Earth's magnetic equatorial plane at their center. [Source: GB /Z 42244-2022, 3.1, with modifications]

3.3 L* L-star An adiabatic invariant that is inversely proportional to the third adiabatic invariant () of particle drift invariant, and is expressed in terms of the Earth's radius (Re). The numerical value of the invariant after dimensionless processing.

3.4 B/B

0 The magnetic flux density on the magnetic field lines is normalized to the magnetic flux density at the magnetic equator.