

ICS 07.060
CCS A 47



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 46138-2025

Grade of geomagnetic activity

地磁活动水平分级

Issued on: August 29, 2025

Implemented on: December 1, 2025

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

Table of Contents

Preface	III
1 Scope	1
2 Normative References	1
3 Terms and Definitions	1
4 Grading of Geomagnetic Activity Levels	2
Appendix A (Informative). Magnetic Disturbance Amplitude Corresponding to the K-index of Geomagnetic Observatories at Different Latitudes	3
Appendix B (Informative). Geographical Location Information of 13 Internationally Used Geomagnetic Stations	4
Reference	5

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 China Meteorological Administration.

This document is under the jurisdiction of the National Technical Committee on Standardization of Satellite Meteorology and Space Weather (SAC/TC347).

This document was drafted by the National Satellite Meteorological Center (National Space Weather Monitoring and Early Warning Center) and the 61741 Unit of the Chinese People's Liberation Army.

The main drafters of this document are: Chen Bo, Lu Xiaoshan, Han Dayang, Du Dan, Zhao Mingxian, Ma Jie, and Wang Lin.

Geomagnetic activity level classification

1 Scope

This document defines the classification of 3-hour individual (regional) and global geomagnetic activity levels.

This document applies to the monitoring and forecasting of geomagnetic activity.

2 Normative references

This document has no normative references.

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1

The magnetic flux density vector of the Earth's magnetic field.

3.2

The projection of the geomagnetic field vector (3.1) onto the horizontal plane in the local rectangular coordinate system.

3.3

The variation of a certain element of the geomagnetic field (usually the horizontal component of the geomagnetic field) relative to the background field during a quiet period.

Note. The varying amplitude of magnetic disturbances can be used to describe the strength of geomagnetic activity.

3.4 geomagnetic index

A parameter describing the degree of magnetic disturbance in the mainland over a certain period of time.

3.5 K-index

Geomagnetic activity description parameters for a single station with a time interval of 3 hours.

Note 1. Data is collected in Greenwich Mean Time, starting from midnight, with each 3-hour period representing a total of 8 data points per day. Records of the three geomagnetic parameters from each geomagnetic station.

Based on the component with the largest amplitude after eliminating regular daily variations within each time period, geomagnetic activity is divided into 10 levels, from level 0 to level 9, according to its strength.

Note 2. The magnitude of the K exponent has an approximately logarithmic relationship with the amplitude of the magnetic disturbance over the 3-hour period. Since the amplitude of the magnetic disturbance increases with latitude, to ensure that the amplitude of the disturbance varies across different geomagnetic observatories globally...

The determined K-index values are approximately equal, but the magnetic disturbance amplitudes corresponding to the K-index values of geomagnetic observatories at different latitudes are also different. The K-index value is related to the 3-hour geomagnetic water...

The corresponding relationship of the amplitude range of the average component disturbance is shown in Appendix A.

[Source. GB/T 31160-2014, 2.8, with modifications]

3.6 Kp index

Description of global geomagnetic activity at 3-hour intervals (divided into time intervals of 0.00-3.00 and 3.00-6.00 GMT). parameter.

Note 1. The Kp index is calculated by averaging the K-indexes of 13 geomagnetic stations located between geomagnetic latitudes of 47° and 63°. These 13 geomagnetic stations are commonly used internationally.