

ICS 07.060
CCS A47



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

GB/T 45062-2024

**Guide for inter-calibration of meteorological satellite infrared
channel**

气象卫星红外通道交叉定标指南

Issued on: December 31, 2024

Implemented on: December 31, 2024

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

Table of Contents

1 Scope	1
2 Normative references	1
3 Terms and Definitions	1
4 Satellite data	2
4.1 Target sensor data	2
4.2 Reference sensor data	2
5 Cross-calibration process	2
6 Matched sample preparation	4
6.1 Preliminary selection of observation data	4
6.2 Data Subset Preparation	4
6.3 Pixel Space Matching	4
6.4 Pixel Time Matching	5
6.5 Observation geometry matching	5
7 Data Transformation and Filtering	5
7.1 Radiation Unit Conversion	5
7.2 Spectral Matching	5
7.3 Spatial uniformity screening	6
7.4 Outlier Removal	6
8 Cross-calibration or evaluation	6
8.1 Sample accumulation and quality judgment	6
8.2 Calculation of radiation calibration coefficients	7
12 Reference	13

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part

1. Structure and drafting rules for standardization documents" Drafting. Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed by the China Meteorological Administration. This document is under the jurisdiction of the National Satellite Meteorology and Space Weather Standardization Technical Committee (SAC/TC347). This document was drafted by: National Satellite

Meteorological Center, 61741 Unit of the People's Liberation Army of China. The main drafters of this document are. Xu Hanlie, Xu Na, Hu Xiuqing, He Xingwei, Chen Lin and Li Honglin. Guidelines for Cross-calibration of Infrared Channels of Meteorological Satellites

1 Scope

GB/T 45062-2024 is the Chinese guide to inter-calibration of meteorological satellite infrared channels. A satellite radiometer drifts after launch and cannot be recovered for recalibration, so the only way to keep a long climate or weather record consistent is to compare its measurements against a better-characterised reference instrument on another spacecraft wherever the two view the same scene at nearly the same time and angle, which is the technique this document standardises. The standard sets the satellite data required, both the target sensor data and the reference sensor data, then the cross-calibration process, and then the mathematics: the collocation criteria in time, space and viewing geometry, the spectral band adjustment between instruments whose response functions differ, the radiance conversion, the regression and the derivation of the calibration correction, the uncertainty estimation and the validation and reporting of the result. It follows the GSICS approach used internationally. It took effect on 31 December 2024.

This document provides the satellite data, processing flow, and Guidance on matching sample preparation, data transformation and screening, cross-calibration or evaluation, and recommendations for recommended reference thresholds. This document applies to the cross calibration of infrared channels of meteorological satellite channel optical remote sensors as target remote sensors.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

GB/T 38236-2019 Laboratory radiation calibration method for aerospace optical remote sensors

GB/T 39094-2020 Terminology of Chinese Meteorological Satellites

GB/T 41541-2022 Basic terms of thermal infrared remote sensing

3 Terms and definitions

The terms and definitions defined in GB/T 38236-2019, GB/T 39094-2020, GB/T 41541-2022 and the following terms and definitions apply in this document.

3.1 A weather satellite orbiting in geosynchronous orbit. [Source: GB/T 39094-2020, 2.7]

3.2 A weather satellite in low Earth orbit.

3.3 Target remote sensor monitored instrument; MON Optical remote sensors to be calibrated or evaluated. [Source: QX/T 388-2017, 3.3, modified]

3.4 Reference remote sensor reference instrument; REF Optical remote sensors used as cross-calibrated radiometric references. [Source: QX/T 388-2017, 3.4, modified]

3.5 The temperature of a black body with the same spectral radiance brightness at the same wavelength interval. [Source: GB/T 41541-2022, 3.21]