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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 34509.2-2017

In-orbit field radiometric calibration for optical remote sensors on land observation satellites - Part 2: Thermal infrared

陆地观测卫星光学遥感器在轨场地辐射定标方法 第2部分：热红外

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Foreword

GB/T 34509 "terrestrial observation satellite optical remote sensor calibration orbit radiation method" is divided into three parts.

--- Part 1. Visible light near infrared;

--- Part 2. Thermal infrared;

--- Part 3. Medium wave infrared. This section GB/T 34509 Part 2. This section drafted in accordance with GB/T 1.1-2009 given rules. This part of the National Aerospace Technology and Application Standardization Technical Committee (SAC/TC425) and focal point. This part of the drafting unit.China Resources Satellite Application Center, China Aerospace Standardization Institute, Beijing Spacecraft overall design department. The main drafters of this section. Fu Qiao Yan, Han Qijin, Wang Aichun, Qin Jingfang, Xu Cuiping, He Wei. Terrestrial Observing Satellite Optical Remote Sensing Radiation on orbit Calibration method Part 2. Thermal infrared

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1 Scope

Part 2 of China's national standard for in-orbit field calibration of land observation satellite sensors, covering the thermal infrared. It specifies the general requirements, the data acquisition, the technical process and calculation method, and the uncertainty analysis. Thermal infrared calibration differs from the visible case in one fundamental respect: the target emits rather than reflects. What the sensor measures is radiation the surface is giving off because of its temperature, which means the ground truth is a temperature measurement and the surface's emissivity has to be known rather than assumed. That is why water bodies are the preferred calibration site - a large lake is uniform, its emissivity is close to one and well known, and its surface temperature can be measured directly. The atmospheric correction is also harder, because water vapour absorbs strongly in the thermal bands and its profile has to be measured at the time of overpass. Getting this right is what makes satellite land surface temperature usable for climate and agriculture.

This part of GB/T 34509 specifies the general requirements of radiation calibration of terrestrial observing satellite thermal infrared remote sensors in orbit, the data obtained Take, technical process, calculation method and uncertainty analysis. This section applies to Terrestrial Observing Satellite (hereinafter referred to as satellite) thermal infrared (8μm ~ 14μm) remote sensor calibration of radiation in the orbit, its His satellite of the same type of remote sensor can be implemented by reference.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version applies to this article Pieces. For undated references, the

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latest edition (including all amendments) applies to this document.

GB/T 14950 Photogrammetry and remote sensing terms

GB/T 32453 Satellite Earth observation data classification rules

3 Terms and definitions

GB/T 14950 and GB/T 32453 and defined by the following terms and definitions apply to this document.

3.1 Radiometer calibration site Surface optical properties, atmospheric optical properties, meteorological conditions, topography and other conditions for satellite remote sensing orbit radiation calibration of natural or Artificial site.

3.2 Radiation calibration in orbitfield radiometriccalibration When the satellite passes the radiation calibration field, the measured optical radiation characteristics of the site are used to calculate the atmospheric radiation transmission and establish The relationship between the observed value of the satellite remote sensor and the radiance of the entrance pupil of the remote sensor.

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