

ICS 33.200  
CCS V 80



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

**GB/T 38199-2019**

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**Evaluation methods for the optical image compression quality  
of land observation satellites**

陆地观测卫星光学影像压缩质量评价方法

**Issued on: October 18, 2019**

**Implemented on: May 1, 2020**

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

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## Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009. This standard is proposed and managed by the National Aerospace Technology and its Application Standardization Technical Committee (SAC/TC425). This standard was drafted. China Resources Satellite Application Center, China Aerospace Standardization Institute. The main drafters of this standard. Zeng Yong, Yi Wei, He Huaying, Wu Yongliang.

In recent years, the number of terrestrial observation satellites launched in China has been increasing, and the breadth and depth of remote sensing applications are developing

rapidly. With the development of industrialization, users are increasingly demanding the quality of optical images of terrestrial observation satellites. Received satellite data storage capacity The impact of volume and transmission capacity, some land observation satellites use lossy compression techniques. Compression can bring about an increase in transmission and storage efficiency, and The loss of image texture details is caused by the lack of scientific and standardized standards for the compression evaluation of terrestrial observation satellites. Applying the compression quality evaluation method used in this standard, it has achieved pressure on China's existing resource series and environmental series satellite optical images. Standardized management of shrinkage quality evaluation, excellent for satellite compression schemes such as Environment One Satellite (HJ-1A/B) and Resource No. 04 (CBERS-04) Transformation has played a key role. Method for evaluating optical image compression quality of terrestrial observation satellites

## 1 Scope

China's national methods for evaluating the compression quality of optical imagery from land observation satellites. It specifies the terms and definitions, the abbreviations and the requirements on simulated data sources, together with the evaluation procedure.

Compression is unavoidable on an imaging satellite: the sensor produces far more data than the downlink can carry, so the imagery is compressed on board before transmission, and the ratio is set by the gap between the two. The question this standard addresses is what that compression costs. Lossy compression removes information, and the information it removes is chosen by an algorithm that was not designed with any particular application in mind - so an artefact invisible to the eye may be exactly what a change detection or a classification algorithm was going to use. Evaluating quality therefore cannot be a single number: it has to be assessed against what the imagery is for.

This standard specifies the requirements, subjective evaluation, objective evaluation and evaluation of visible light full-color/multispectral compression simulation data sources for terrestrial observation satellites. The content of the judgment of the price result. This standard applies to the impact of compression on the quality of visible light full/multispectral imagery during the development phase of terrestrial observation satellites, hyperspectral and infrared For compression quality evaluation, refer to the use.

## 2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article. Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 14950-2009 Photogrammetry and Remote Sensing Terminology

### 3 Terms and definitions

The following terms and definitions as defined in GB/T 14950-2009 apply to this document.

3.1 Image compression imagecompression Image processing technology that saves storage space by removing image grayscale data redundancy.

3.2 Lossy compression compressionwithloss Compression allows for some degree of distortion with the original image and compression that meets the limits of reasonable fidelity.

3.3 Subjective evaluation subjectiveevaluation Through the observation of the human eye, the image quality is evaluated by the subjective feeling of the person.

3.4 Objective evaluation of objectiveevaluation Image quality was assessed using objective, quantitative indicators.

3.5 Image histogram imagehistogram A probability density distribution map showing the statistical relationship between the image gray value and the number of pixels.

### 4 Abbreviations

The following abbreviations apply to this document. DPI

---dots per inch (DotsPerInch)