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

GB/T 44006-2024

**Rules for the representation of infrared image temperature -
Method by RGB**

红外图像温度表示规则 RGB法

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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 Chinese Academy of Sciences: This document is under the jurisdiction of the National Technical Committee for Photoelectric Measurement Standardization (SAC/TC487): This document was drafted by: Shanghai Institute of Technical Physics, Chinese Academy of Sciences, Beijing Institute of Technology, Dongguan Zhongke Cloud Computing Research Institute, Wuhan University of Science and Technology, Dezhigan Technology Co., Ltd., Zhongke Huguang (Tianjin) Applied Laser Technology Research Institute Co., Ltd., Zhejiang Dali Technology Co., Ltd., Yantai Taairui Optoelectronics Technology Co., Ltd., National Quality Supervision and Inspection Center for Infrared and Industrial Electric Heating Products, and Aerospace Information Innovation Research Institute of the Chinese Academy of Sciences Institute, Wuhan Guide Infrared Co., Ltd: The main drafters of this document are: Li Xue, Fan Guangyu, Yang Yuanyuan, Liang Hong, Jin Weiqi, Tang Guangfa, Huang Sheng, Lu Zichen, Zhang Zhiqiang, Jiang Jianghui, Qi Yalu, Liu Min, Wu Di, Wang Pu, Cui Changhao, Huang Jianzhong: Infrared image temperature representation rules RGB method

1 Scope

GB/T 44006-2024 sets the rules for representing temperature in an infrared image by RGB colour. It addresses a real loss of information: a thermal camera measures a temperature at every pixel, but what is stored, shared and published is usually a false-colour image, and once the radiometric data is gone the temperature can only be recovered from the colour if the mapping is known. Different manufacturers use different palettes, and the same palette is applied over different ranges, so the same colour means different things in two images. The standard defines the mapping between temperature and RGB value, the palettes and

their construction, the encoding of the temperature range and the scale that must accompany the image, the rules for quantisation and for the treatment of values outside the range, the requirements on the accompanying metadata, and the procedure for recovering the temperature from a compliant image. It takes effect on 1 November 2024.

This document describes how to convert the temperature field obtained by calculating the thermal infrared image and infrared radiation characteristics into visible. The principle and method of optical pseudo-color imaging, including the temperature field image conversion grayscale image algorithm, grayscale image enhancement processing algorithm and grayscale image definition. A color lookup table of pseudo-color RGB values corresponding to the saturation values: This document is applicable to infrared thermal imagers in the fields of biological detection, security, industrial temperature measurement, and agriculture, etc: After the temperature field image is obtained, the temperature field image is mapped to a grayscale image and then converted to a pseudo-color image represented by RGB color:

2 Normative references

This document has no normative references:

3 Terms and definitions

The following terms and definitions apply to this document: 3:1 infrared radiation; IR Electromagnetic radiation with a wavelength greater than that of visible light and smaller than that of radio waves:

Note 1: The wavelength range of infrared radiation in vacuum is 750nm~1mm:

Note 2: Any object with a temperature higher than absolute zero (-273:15°C) will emit infrared radiation: The amount of radiation energy depends on the surface temperature and surface radiation of the object: Determined by the emission characteristics: [Source: GB/T 12604:9-2021, 3:17, modified] 3:2 A device that converts infrared radiation from an object's surface into a visible image:

Note 1: Infrared thermal imagers have the function of measuring temperature and can quantitatively draw the temperature distribution on the surface of an object and encode the grayscale image into pseudo-color:

Note 2: The infrared thermal imager consists of an infrared optical system, an infrared detector and an electronic processing system: [Source: GB/T 19870-2018, 3:1, modified]

3:3 thermal infrared image An image is generated by collecting and recording the thermal infrared radiation information radiated by the object being measured through an infrared detector:

Note: In this document, infrared images are referred to as such: When it is necessary to emphasize that infrared images are thermal infrared images, the abbreviation is not used:

3:

4 Temperature field image thermalfieldimage The image of the temperature distribution of the object being measured is inverted using the infrared image and the radiation characteristics of the object being measured: 3:

5 Measuring range The effective temperature measurement range of infrared thermal imagers:

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