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

GB/T 45410.7-2026

**Optics and photonics - Test methods for telescopic systems -
Part 7: Limit of resolution**

光学和光子学 望远镜系统试验方法 第7部分：极限分辨力

(English Translation)

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References

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.

This document is Part 7 of GB/T 45410, "Test Methods for Optical and Photonic Telescope Systems". GB/T 45410 has been issued.

The following parts were laid out.

---Part 1: Basic Characteristics;

---Part 2: Binoculars;

---Part 3: Aiming the Telescope;

---Part 5: Transmittance;

---Part 7: Limiting Resolution.

This document is equivalent to ISO 14490-7:2016 "Test methods for optical and photonic telescope systems - Part 7: Limiting resolution".

Test methods.

The following minimal editorial changes have been made to this document.

---To harmonize with existing standards, the standard name has been changed to "Test Methods for Optical and Photonic Telescope Systems - Part 7: Limits".

Resolution.

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 Machinery Industry Federation.

This document is under the jurisdiction of the National Technical Committee on Standardization of Optics and Photonics (SAC/TC103).

Introduction

The telescope system is the core component of various telescopes and is widely used in astronomical observation, space remote sensing, geodesy, weaponry, and education.

In fields such as sports, cultural entertainment, and tourism, the applications of telescopes are expanding daily. With advancements in science and technology and socio-economic development, the range of applications for telescopes is increasingly broadening.

Large-scale production and output have gradually increased, and the industry has reached a considerable scale.

With the rapid development of various telescope system technologies both domestically and internationally, the testing methods for the ultimate resolution of telescope systems and observation telescopes are becoming increasingly important.

The accuracy of information presented in legal and test reports is crucial to the standard setting, technical document preparation, and compilation of teaching materials and publications for telescope system products.

The consistency and accuracy of technical language in writing, design, manufacturing, and quality assessment have an impact on the development and standardized description of the entire telescope system.

The impact is significant.

For the reasons mentioned above, and based on the technical and operational characteristics of the telescope system, an experiment was conducted to test the limiting resolution of the telescope system and the observation telescope.

It is essential to standardize and regulate the expression of methods and experimental report information.

GB/T 45410 "Test Methods for Optical and Photonic Telescope Systems" is proposed to consist of ten parts.

---Part 1: Basic Characteristics. The purpose is to specify the test methods for the technical parameters of the telescope system.

---Part 2: Binoculars. The purpose is to specify test methods for the technical parameters of binocular systems.

---Part 3: Aiming Telescope. The purpose is to specify the test methods for the technical parameters of aiming telescope systems.

---Part 4: Astronomical Telescopes. The purpose is to specify test methods for the technical parameters of astronomical telescope systems.

---Part 5: Transmittance. The purpose is to specify the test methods for the technical parameters of a telescope system.

---Part 6: Glare Shielding Index. The purpose is to specify the test methods for the technical parameters of telescope systems.

---Part 7: Limiting Resolution. The purpose is to specify the test methods for the technical parameters of a telescope system.

---Part 8: Night Vision Devices. The purpose is to specify test methods for the technical parameters of night vision device systems.

---Part 9: Field Curvature. The purpose is to specify the test methods for the technical parameters of a telescope system.

---Part 10: Axial Color Properties. The purpose is to specify test methods for the technical parameters of telescope systems.

Test methods for optical and photonic telescope systems Part 7: Limiting Resolution

1 Scope

This document specifies the test methods for the limit resolution of telescope systems and observation telescopes.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

ISO 14132-1 Optical and Photonic Telescope Systems Terminology Part 1: General Terminology and Alphabetical Sequences of ISO 14132 Terminology Note. GB/T 44403-2024 General Terminology for Optical and Photonic Telescope Systems and Binoculars, Monoculars, Observation Mirrors and Aiming Telescopes Terminology (ISO 14132-1:2015, ISO 14132-2:2015, ISO 14132-3:2021, MOD) ISO 14490-1:2005 Optics and optical instruments - Test methods for telescope systems - Part 1: Test methods for fundamental characteristics) Note. GB/T 45410.1-2025 Optical and photonic telescope systems - Test methods - Part 1: Fundamental characteristics (ISO 14490-1:2005, MOD)

3 Terms and Definitions

The terms and definitions defined in ISO 14132-1 apply to this document.

The URLs for the terminology databases maintained by ISO and IEC for standardization are as follows.

4.1 General Provisions

The limiting resolution of a telescope system is the center line between two adjacent bright (or dark) lines on a resolution plate that can be observed from the specimen.

The minimum angular distance between them.

4.2 Test Apparatus

The limiting resolution of the telescope system should be tested according to the test setup shown in Figure 1.

The contrast ratio of the resolution panel is calculated according to formula (1).

$\tau_{tr}-\tau_{up}$

$\tau_{tr} \tau_{up}$

≥ 0.9 (1)