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

GB/T 44078-2024

**Determination of optical center distance in photoelectric
system - Low coherence interferometry**

光电系统中光学中心间距的测定 低相干干涉测量法

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Foreword

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1 Scope

GB/T 44078-2024 gives the low coherence interferometry method for measuring the centre distances between the optical surfaces of an assembled photoelectric system. The air gaps and element thicknesses inside a lens assembly determine its performance, and once the barrel is closed there is no mechanical way to check them; low coherence interferometry solves this by using a source with a coherence length of a few micrometres, so an interference signal appears only when the reference path matches a particular surface, and the surfaces can be located one by one through the stack. The standard sets the measurement principle, covering the classification of the methods and both the time domain and frequency domain variants, the measurement conditions of environment and sample, the measuring equipment, the measurement steps from preparation and parameter presetting through the measurement to the validity of the result, and the data processing, uncertainty and test report. It took effect on 1 December 2024.

This document describes the principle, measurement conditions, measurement equipment, measurement methods and methods of measuring the distance between optical centers in optoelectronic systems by low-coherence interferometry. Steps and measurement data processing. This document is applicable to the measurement of optical center distances in optoelectronic systems and is used as a reference for the measurement of optical plate thickness.

2 Normative references

This document has no normative references.

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 The distance between the center points of an optical component's surface.

Note. Includes the center thickness of the optical element and the air space between two adjacent optical elements.

3.2 coherence length The maximum optical path difference between two light waves

emitted from the same point of the light source at different times within the coherence time that is coherent.

3.3 Low coherence The coherence length of light is short.

3.4 Interference The phenomenon that two or more light waves reinforce and weaken each other in the overlapping area. [Source: GB/T 13962-2009, 4.8]

3.5 Sample light path samplelightpath In low-coherence interferometry, the optical path of the two interfering light waves includes the optical path of the sample being measured.

3.6 Reference light path referencelightpath In low-coherence interferometry, the optical path of the two interfering light waves does not include the optical path of the sample being measured.

3.7 optical path [distance] The product of the geometric distance traveled by light in a medium and the refractive index of the medium. [Source: GB/T 13962-2009, 2.39]