BSI Standards Publication

Optics and photonics — Test methods for telescopic systems

Part 9: Test methods for field curvature

bsi.

National foreword

This British Standard is the UK implementation of ISO 14490-9:2019.

The UK participation in its preparation was entrusted to Technical Committee CPW/172, Optics and Photonics.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Foreword

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This document was prepared by Technical Committee ISO/TC 172, *Optics and photonics*, Subcommittee SC 4, *Telescopic systems*.

A list of all parts in the ISO 14490 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

As mentioned in ISO 14490-7, there are several characteristics which determine image quality, besides the limit of resolution. One unmentioned characteristic there is field curvature which can be noted by the user as a field dependent defocus, which however could be refocused using the test specimen's focusing facility.

The intermediate image surface of a telescopic system (except Galilean systems) usually exhibits a curvature instead of being a plane surface, depending on the optical characteristics of the objective lens system. In addition, the surface can be split into two separate surfaces, the sagittal and tangential image surfaces.

This surface, in turn, is being imaged by the eyepiece onto a virtual image surface (looked at by the user) which also can be split into two separate surfaces. Due to the optical characteristics of the eyepiece, the slope of the curvature of these surfaces might be different from those of the intermediate image surfaces.

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Part 9: Test methods for field curvature

1 Scope

This document specifies the test method for the determination of the deviation from a flat image surface, i.e. the sagittal and tangential field curvature of telescopic systems and observational telescopic instruments.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 14132-1, *Optics and photonics — Vocabulary for telescopic systems — Part 1: General terms and alphabetical indexes of terms in ISO 14132*

ISO 14490-1:2005, *Optics and optical instruments — Test methods for telescopic systems — Part 1: Test methods for basic characteristics*

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in ISO 14132-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following address:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
field curvature
aberration of a lens resulting in a curved image field from a plane object field

Note 1 to entry: The image field could be spherical or non-spherical.

[SOURCE: ISO 10934-1:2002, 2.4.4, modified – Note 1 to entry has been added.]

4 Requirements

4.1 General

Field curvature of a telescopic system is a field dependent defocus value, usually increasing towards the edge of the field of view, which can degrade image resolution because the eye might not be able to accommodate to the defocus. Field curvature can be split into a sagittal and a tangential image surface which are measured with a radially or tangentially arranged test pattern, respectively.