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Geographic information — Calibration and validation of remote sensing data and derived products

Part 1: Fundamentals

bsi.

National foreword

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 211, *Geographic information/Geomatics*.

A list of all parts in the ISO 19124 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.

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Introduction

The ISO 19124 series addresses post-launch calibration and validation (Cal/Val) of remotely sensed data and products derived from the data. This document, ISO 19124-1, provides the fundamentals and a common framework on Cal/Val of remote-sensing data and derived products. Subsequent parts of the ISO 19124 series deal with sensor- or product-specific Cal/Val.

NOTE In contrast to the ISO 19124 series, the ISO 19159 series focuses on the pre-launch Cal/Val process of the sensor and hardware.

This document was drafted based on material provided by the major organizations that are active in this field such as CEOS (international), NASA (USA), ESA (Europe), JAXA (Japan), CSIRO (Australia), and the Chinese space agency.

In accordance with the ISO/IEC Directives, Part 2, 2018, Rules for the structure and drafting of International Standards, in International Standards the decimal sign is a comma on the line. However, the General Conference on Weights and Measures (Conférence Générale des Poids et Mesures) at its meeting in 2003 passed unanimously the following resolution:

"The decimal marker shall be either a point on the line or a comma on the line."

In practice, the choice between these alternatives depends on customary use in the language concerned. In the technical areas of geodesy and geographic information it is customary for the decimal point always to be used, for all languages. That practice is used throughout this document.

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TECHNICAL SPECIFICATION **ISO/TS 19124-1:2023(E)**

Geographic information — Calibration and validation of remote sensing data and derived products —

Part 1: Fundamentals

1 Scope

The ISO 19124 series is focused on calibration and validation (Cal/Val) of remote sensing data, which are collected by a sensor on-board a platform in a mission, and products derived in part or whole from the data. The ISO 19124 series defines the metadata related to the calibration and validation process that has not been defined in other ISO/TC 211 International Standards. The metadata allows the data providers to provide a standardized description of the Cal/Val process they have applied to the data. It allows the data users to get the same forms of metadata from different data providers.

This document addresses the overall framework and common calibration and validation processes related to Earth observation data and derived products from different types of remote sensors.

Subsequent parts in the ISO 19124 series will target data from specific sensors, for example, infrared, ultraviolet/visible/near-infrared, microwave, or broadband, products derived from those data, and calibration and validation sites.

Calibration addresses a geometric, radiometric, or spectral correction of the data. Validation addresses an evaluation of the quality and the accuracy of the data and the derived products.

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 19157-1, *Geographic information — Data quality — Part 1: General requirements*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

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

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

3.1
accuracy
closeness of agreement between a test result or measurement result and the true value

[SOURCE: ISO 3534-2:2006, 3.1.1, modified — Notes to entry have been removed.]

3.2
bias
magnitude of the non-random or systematic errors of a result

Note 1 to entry: A bias can be positive or negative.

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