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

GB/T 44490.2-2024

**Geographic information - Imagery sensor models for
geopositioning - Part 2: SAR, InSAR, lidar and sonar**

地理信息 成像传感器的地理定位模型 第2部分：SAR，InSAR，lidar和sonar
(English Translation)

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References

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.

This document is part 2 of GB/T 44490 "Geographic Positioning Model for Geographic Information Imaging Sensors". GB/T 44490 has been the following parts were published.

--- Part 2: SAR, InSAR, lidar and sonar.

This document is equivalent to ISO/T S19130-2:2014 "Geographic Positioning Model for Geographic Information Imaging Sensors Part 2.

SAR, InSAR, lidar and sonar", the file type was adjusted from ISO technical specifications to my country's national standards.

The following minimal editorial changes were made to this document.

--- Added GCP, HPRH and WGS84 to the abbreviations;

---Corrected three editorial errors about GPS in the original text to GNSS;

--- The order of chapters has been adjusted according to the latest requirements of national standards. "Consistency" in the second chapter of the original text has been moved to the fifth chapter of this document.

Accordingly, Appendix A and Appendix B are interchanged.

Introduction

This document specifies synthetic aperture radar (SAR), interferometric synthetic aperture radar (InSAR), laser radar (lidar) and sonar (sonar) the geolocation information required for image data makes it easy for users to geolocate the observation data based on the

sensor's physical-geometric imaging model.

By standardizing the description of different sensors, basic metadata necessary for geolocation is provided to data providers and processing systems.

Requirements. The term "observation" in this document is the basic meaning of the term, not the meaning of "observation" listed in GB/T 41448-2022.

The surveying and mapping, remote sensing professional institutions and data providers of the relevant departments have completed the collection, processing and distribution of a large amount of image data through the imaging system.

Extracting geographic information from these data requires further processing. Geographic positioning is the process of converting objects from image coordinates to ground coordinates.

Due to the diversity of sensor types and the lack of a unified model standard, the data provided by different manufacturers may contain different There is no parameter information for each sensor, or there is a lack of description of sensor parameters, or there is a lack of auxiliary information required for positioning and analysis.

The sensor or data producer develops a separate software package to complete the corresponding data processing. Standard sensor models and geolocation metadata facilitate Image data agents or suppliers develop common software products to process data from different data producers or multiple sensors.

With reference to these standards, data producers describe the geographic location information of their data in the same way, thereby improving the data interoperability between application systems.

Operability, facilitating data exchange.

GB/T 44490 "Geographic Positioning Model for Geographic Information Imaging Sensors" is planned to consist of three parts.

--- Part 1: Basics. Provides location models and metadata associated with all types of sensors, including swing-broom, push-broom, frame-width metadata for the adaptive geolocation function, regardless of the function is part of the corresponding model or a true alternative model. In addition it provides the schema for these metadata elements.

--- Part 2: SAR, InSAR, lidar and sonar. This section extends the ground by providing physical sensor models for lidar and sonar.

Part 2 also defines the metadata element set required for navigation and positioning, and provides a more detailed element set for SAR.

The metadata required for aerial triangulation of imagery from air and satellite platforms is presented and a paradigm is provided for all these metadata elements.

--- Part 3: Implementation model. For the sensor physical model, sensor substitution model and sensor corresponding model defined in the first two parts, the corresponding XML schema definition is given.

Geo-location Model for Geographic Information Imaging Sensors Part 2: SAR, InSAR, lidar and sonar

1 Scope

Metadata required for aerial triangulation of ground-based and space-based imagery.

This document specifies the details required to describe SAR, InSAR, lidar, and sonar sensors, including rigorous construction of the physical sensor the relevant physical and geometric information required by the model. According to the need for precise geographic positioning, this document provides mathematical calculation formulas for rigorous construction Physical sensor model from 2D image space to 3D ground space, and computationally related error propagation.

This document does not specify how users obtain geographic location data, or the format or content of the generated data.

2 Normative references

The contents of the following documents constitute essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document.

GB/T 19710.2-2016 Geographic Information Metadata Part 2: Imagery and Grid Data Extension (ISO 19115-2.

2009, IDT)

GB/T 22022-2008 Geographic Information Time Model (ISO 19108:2002, IDT) GB/T 23707-2009 Spatial model of geographic information (ISO 19107:2003, IDT) GB/T 30170-2013 Geographic information - Coordinate-based spatial reference (ISO 19111:2007, IDT) GB/T 35647-2017 Geographic Information Conceptual Model Language (ISO/T S19103.2015, IDT) Part 1: Fundamentals)

3 Terms and definitions

The following terms and definitions apply to this document.

Active sensor A sensor (3.66) that generates energy and uses it to perform detection.