



SLOVENSKI STANDARD SIST ISO 19111-2:2009

01-december-2009

; Yc[fUZg_Y]bZfa UWY!@WfUbY'g'_ccfX]bUfLa]!'&"XY.'FUny]f]Hj 'nU
dUfLa Yf] bYj fYXbcgH]

Geographic information - Spatial referencing by coordinates - Part 2: Extension for parametric values

iTeh STANDARD PREVIEW

Information géographique - Système de références spatiales par coordonnées - Partie 2: Supplément pour valeurs paramétriques

[SIST ISO 19111-2:2009](https://standards.iteh.ai/catalog/standards/sist/d7ded40f-8a76-4bdb-887a-115a50bc1113/sist-iso-19111-2-2009)

Ta slovenski standard je istoveten z: **ISO 19111-2:2009**

ICS:

| | | |
|-----------|-----------------------------------|----------------------------|
| 35.240.70 | Uporabniške rešitve IT v znanosti | IT applications in science |
|-----------|-----------------------------------|----------------------------|

SIST ISO 19111-2:2009

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST ISO 19111-2:2009

<https://standards.iteh.ai/catalog/standards/sist/d7ded40f-8a76-4bdb-887a-113a50be1113/sist-iso-19111-2-2009>

**Geographic information — Spatial
referencing by coordinates —**

**Part 2:
Extension for parametric values**

*Information géographique — Système de références spatiales par
coordonnées*

iTeh STANDARD PREVIEW
Partie 2: Supplément pour valeurs paramétriques
(standards.iteh.ai)

[SIST ISO 19111-2:2009](https://standards.iteh.ai/catalog/standards/sist/d7ded40f-8a76-4bdb-887a-113a50be1113/sist-iso-19111-2-2009)

<https://standards.iteh.ai/catalog/standards/sist/d7ded40f-8a76-4bdb-887a-113a50be1113/sist-iso-19111-2-2009>



ISO 19111-2:2009(E)**PDF disclaimer**

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST ISO 19111-2:2009

<https://standards.iteh.ai/catalog/standards/sist/d7ded40f-8a76-4bdb-887a-113a50be1113/sist-iso-19111-2-2009>

**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2009

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

| | |
|--|----|
| Foreword | iv |
| Introduction..... | v |
| 1 Scope | 1 |
| 2 Conformance | 1 |
| 3 Normative references | 1 |
| 4 Terms and definitions | 1 |
| 5 Conventions | 2 |
| 5.1 Abbreviated terms | 2 |
| 5.2 UML notation..... | 2 |
| 5.3 Attribute status | 2 |
| 6 Spatio-parametric referencing | 3 |
| 6.1 Overview..... | 3 |
| 6.2 Parametric coordinate reference system..... | 3 |
| 6.3 Parametric coordinate system | 4 |
| 6.4 Parametric datum | 6 |
| 6.5 Spatio-parametric coordinate reference system..... | 7 |
| 6.6 Spatio-parametric coordinate reference system with time | 8 |
| 6.7 Transformation and conversion of parametric coordinate reference systems | 8 |
| Annex A (normative) Conformance | 9 |
| Annex B (informative) Examples | 11 |
| Bibliography..... | 16 |

ISO 19111-2:2009(E)

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 19111-2 was prepared by Technical Committee ISO/TC 211, *Geographic information/Geomatics*.

ISO 19111 consists of the following parts, under the general title *Geographic information — Spatial referencing by coordinates*:

— *Geographic information — Spatial referencing by coordinates*

— *Part 2: Extension for parametric values*

[SIST ISO 19111-2:2009](https://standards.iteh.ai/catalog/standards/sist/d7ded40f-8a76-4bdb-887a-113a50be1113/sist-iso-19111-2-2009)

<https://standards.iteh.ai/catalog/standards/sist/d7ded40f-8a76-4bdb-887a-113a50be1113/sist-iso-19111-2-2009>

Introduction

ISO 19111 describes the elements necessary to fully define various types of reference systems used for spatial referencing by coordinates. In ISO 19111, a coordinate is one of n scalar values that define the position of a point. ISO 19111 allows for coordinates which are angular, such as latitude and longitude, or linear, such as easting and northing. It also describes the concept of a compound coordinate reference system, which uses at least two independent coordinate reference systems to describe a three-dimensional spatial position.

Scientific communities, especially those concerned with the environmental sciences, frequently express spatial position partially in terms of a parameter or function. Within these communities, this parameter or function is treated as a coordinate. Its relationship with a spatial dimension will usually be non-linear. Examples are widespread, but latitude, longitude and pressure is a commonly encountered example.

This part of ISO 19111 defines a parametric coordinate reference system using the concepts of ISO 19111. The provisions of ISO 19111 are then used to include a parametric coordinate reference system as part of a compound coordinate reference system. Optionally, time can also be included as an additional axis or as axes.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST ISO 19111-2:2009](https://standards.iteh.ai/catalog/standards/sist/d7ded40f-8a76-4bdb-887a-113a50be1113/sist-iso-19111-2-2009)

<https://standards.iteh.ai/catalog/standards/sist/d7ded40f-8a76-4bdb-887a-113a50be1113/sist-iso-19111-2-2009>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST ISO 19111-2:2009

<https://standards.iteh.ai/catalog/standards/sist/d7ded40f-8a76-4bdb-887a-113a50be1113/sist-iso-19111-2-2009>

Geographic information — Spatial referencing by coordinates —

Part 2: Extension for parametric values

1 Scope

This part of ISO 19111 specifies the conceptual schema for the description of spatial referencing using parametric values or functions. It applies the schema of ISO 19111 to combine a position referenced by coordinates with a parametric value to form a spatio-parametric coordinate reference system (CRS). The spatio-parametric CRS can optionally be extended to include time.

The intended users of this part of ISO 19111 are producers and users of environmental information.

Parameters which are attributes of spatial locations or features, but which are not involved in their spatial referencing, are not addressed by this part of ISO 19111.

2 Conformance requirements

Any CRS for which conformance to this part of ISO 19111 is claimed shall be in accordance with Annex A.

3 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the cited edition applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 19111:2007, *Geographic information — Spatial referencing by coordinates*

4 Terms and definitions

For the purposes of this document the terms and definitions of ISO 19111 and the following apply.

4.1

parametric coordinate system

one-dimensional coordinate system where the axis units are parameter values which are not inherently spatial

4.2

parametric coordinate reference system

coordinate reference system based on a parametric datum

ISO 19111-2:2009(E)**4.3****parametric datum**

datum describing the relationship of a parametric coordinate system to an object

NOTE The object is normally the Earth.

4.4**spatio-parametric coordinate reference system**

compound coordinate reference system in which one constituent coordinate reference system is a parametric coordinate reference system and one is a spatial coordinate reference system

NOTE Normally the spatial component is “horizontal” and the parametric component is “vertical”.

4.5**spatio-parametric-temporal coordinate reference system**

compound coordinate reference system comprised of spatial, parametric and temporal coordinate reference systems

5 Conventions**5.1 Abbreviated terms**

CCRS Compound Coordinate Reference System

CRS Coordinate Reference System

CS Coordinate System

GML Geography Markup Language

UML Unified Modelling Language

ITeH STANDARD PREVIEW
(standards.iteh.ai)
<https://standards.iteh.ai/catalog/standards/sist/d7ded40f-8a76-4bdb-887a-113a50be1113/sist-iso-19111-2-2009>

5.2 UML notation

In this part of ISO 19111, the conceptual schema for describing spatio-parametric referencing is modelled with the Unified Modelling Language (UML). The basic data types and UML diagram notations are defined in ISO/TS 19103 and ISO/IEC 19501.

5.3 Attribute status

In this part of ISO 19111, attributes are given an obligation status:

| Obligation | Definition | Meaning |
|------------|------------|-----------------------------------|
| M | Mandatory | This attribute shall be supplied. |
| O | Optional | This attribute may be supplied. |

In Tables 1 to 3, the “Maximum occurrence” column indicates the maximum number of occurrences of attribute values that are permissible, with “N” indicating no upper limit.

6 Spatio-parametric referencing

6.1 Overview

ISO 19111 defines a *coordinate reference system* (CRS) as a coordinate system which is related to an object (such as the Earth) by a datum. A *coordinate system* (CS) is a set of mathematical rules for specifying how coordinates are to be assigned to points. A coordinate system will have one or more axes. A *datum* defines the position of the origin, the scale, and the orientation of a coordinate system. ISO 19111 describes several subtypes of coordinate reference system, coordinate system and datum. This part of ISO 19111 defines a further subtype of each to accommodate parametric referencing.

6.2 Parametric coordinate reference system

A parametric coordinate reference system shall be a subtype of a single CRS. Figure 1 shows the UML schema, which shall consist of one parametric coordinate system and one parametric datum, these elements being according to 6.3 and 6.4.

Table 1 specifies the attributes of a parametric coordinate reference system inherited from SC_SingleCRS.

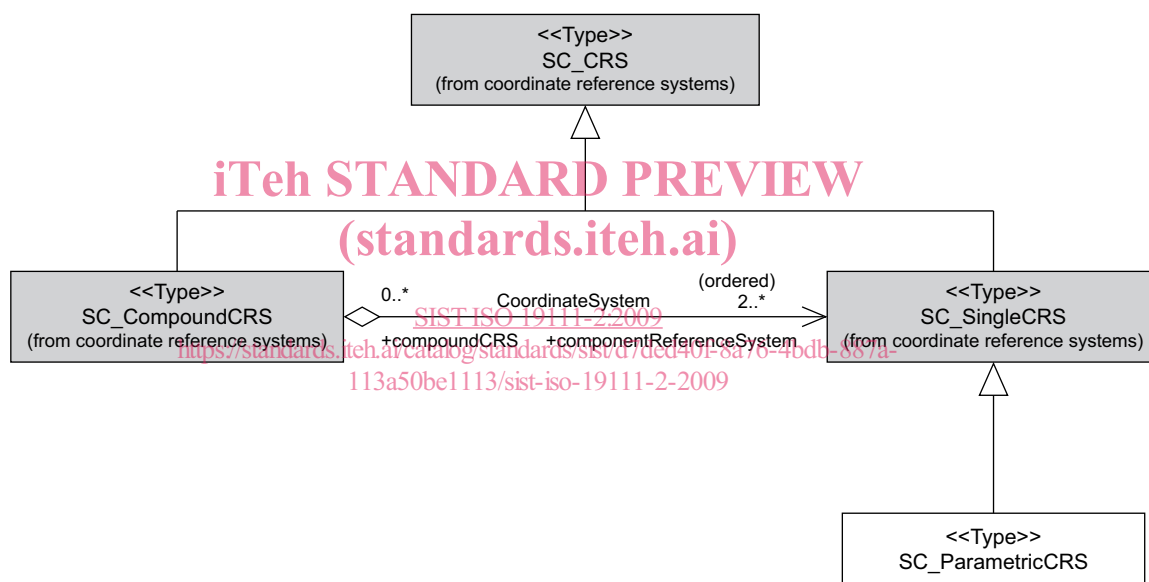


Figure 1 — UML schema for parametric CRS