

# OGC® DOCUMENT: 18-053R2

External identifier of this OGC® document: <http://www.opengis.net/docs/CS/3DTiles/1.0>



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# OGC DOCUMENT TITLE

COMMUNITY STANDARD

APPROVED

**Version:** 1.0

**Submission Date:** 2018-06-04

**Approval Date:** 2018-12-14

**Publication Date:** 2019-01-31

**Editor:** Patrick Cozzi, Sean Lilley

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## ABSTRACT

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<Insert Abstract Text here>



## KEYWORDS

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The following are keywords to be used by search engines and document catalogues.

keyword\_1, keyword\_2, keyword\_3, etc.



# PREFACE

---

This document establishes the OGC CRS ontology and its submodules. The definition of elements of coordinate reference systems is an essential part of geospatial data provision. However, until now, coordinate reference systems and their components could not be represented in an OGC-standardized semantic web vocabulary. This document introduces the ontology model, its classes and properties, application examples and can serve as the foundation of a semantic web based coordinate system registry at OGC. Special attention is given to the compatibility of the CRS Ontology vocabulary to other OGC-endorsed Semantic Web standards such as GeoSPARQL and alignments to other data standards are provided as part of this specification.

**NOTE:** Insert Preface Text here. Give OGC specific commentary: describe the technical content, reason for document, history of the document and precursors, and plans for future work.

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## SECURITY CONSIDERATIONS

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No security considerations have been made for this Standard.



## SUBMITTING ORGANIZATIONS

---

The following organizations submitted this Document to the Open Geospatial Consortium (OGC):

- Open Geospatial Consortium



## SUBMITTERS

---

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## SOURCE OF THE CONTENT FOR THIS OGC DOCUMENT

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## VALIDITY OF CONTENT

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## FUTURE WORK

---

**NOTE:** If you need to place any further sections in the preface area use the [ .preface ] attribute.



## CONTRIBUTORS

---

Additional contributors to this Standard include the following:

Individual name(s), Organization

1

# SCOPE

---



# SCOPE

---

<Insert Scope text here>

**NOTE:** Give the subject of the document and the aspects of that scope covered by the document.



2

# CONFORMANCE

---



## CONFORMANCE

---

<Insert conformance content here>

**NOTE:** Provide a short description of the content approached in subsequent sections and the main subject of the document



3

# 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.

*Identification of Common Molecular Subsequences.* Smith, T.F., Waterman, M.S., J. Mol. Biol. 147, 195–197 (1981)

*ZIB Structure Prediction Pipeline: Composing a Complex Biological Workflow through Web Services.* May, P., Ehrlich, H.C., Steinke, T. In: Nagel, W.E., Walter, W.V., Lehner, W. (eds.) Euro-Par 2006. LNCS, vol. 4128, pp. 1148–1158. Springer, Heidelberg (2006)

*The Grid: Blueprint for a New Computing Infrastructure.*, Foster, I., Kesselman, C.. Morgan Kaufmann, San Francisco (1999).

*Grid Information Services for Distributed Resource Sharing.* Czajkowski, K., Fitzgerald, S., Foster, I., Kesselman, C. In: 10th IEEE International Symposium on High Performance Distributed Computing, pp. 181–184. IEEE Press, New York (2001)



The background features a dark blue field with several thin, light yellow lines intersecting at various points. Three of these intersection points are marked with small yellow dots. One dot is located in the upper right quadrant, another in the middle right, and a third in the lower left. The overall design is minimalist and modern.

4

# TERMS AND DEFINITIONS

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This document uses the terms defined in OGC Policy Directive 49, which is based on the ISO/IEC Directives, Part 2, Rules for the structure and drafting of International Standards. In particular, the word “shall” (not “must”) is the verb form used to indicate a requirement to be strictly followed to conform to this document and OGC documents do not use the equivalent phrases in the ISO/IEC Directives, Part 2.

This document also uses terms defined in the OGC Standard for Modular specifications (OGC 08-131r3), also known as the ‘ModSpec’. The definitions of terms such as standard, specification, requirement, and conformance test are provided in the ModSpec.

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

## 4.1. example term

---

term used for exemplary purposes

**Note 1 to entry:** An example note.

Example      Here’s an example of an example term.

[SOURCE: ]



5

# CONVENTIONS

---

**NOTE:** This section provides details and examples for any conventions used in the document. Examples of conventions are symbols, abbreviations, use of XML schema, or special notes regarding how to read the document.

## 5.1. Identifiers

---

The normative provisions in this standard are denoted by the URI

<http://www.opengis.net/spec/{standard}/{m.n}>

All requirements and conformance tests that appear in this document are denoted by partial URIs which are relative to this base.

## 5.2. Other conventions

---

<Place any other convention needed with its corresponding title>



6

# CORE

---

This clause establishes the **Core** Requirements class, with IRI /req/core, which has a corresponding Conformance Class, **Core**, with IRI /conf/core.

The Core module establishes a set of classes and properties which define the building blocks of a spatial reference system definition. Some of the definitions are extended in specialized modules related to the Core module.

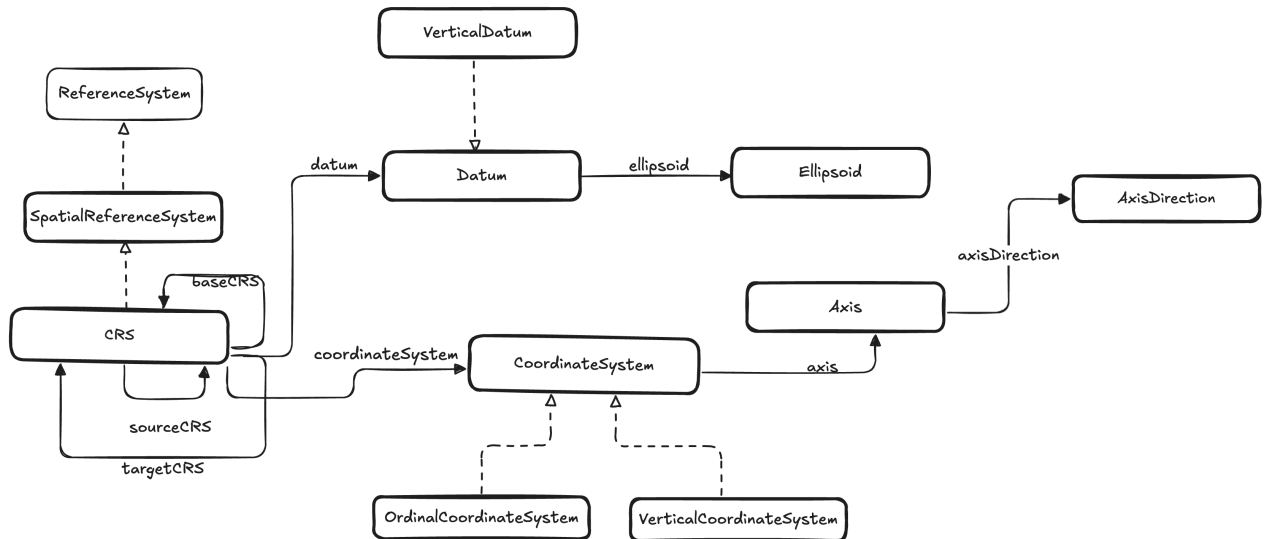


Figure 1

From a base class SpatialReferenceSystem, we define a class for a coordinate system, as the superclass of all spatial reference systems describing locations using coordinates. These SpatialReferenceSystems are described using a Datum and a coordinate system definitions with at least one coordinate axis. Together with several subtypes of coordinate reference system, these definitions complete the Core module.

## REQUIREMENTS CLASS 1: 06-CORE.ADOC EXTENSION

IDENTIFIER	/req/core
TARGET TYPE	Implementation Specification
CONFORMANCE CLASS	Conformance class A.1: /conf/core
REQUIREMENT	/req/core/Coordinate_Reference_System_Parameters
	/req/core/Coordinate_Reference_System_Types
	/req/core/Coordinate_Reference_System_Properties

# 6.1. Coordinate Reference System Parameters

Requirement 1: Coordinate Reference System Parameters	
IDENTIFIER	/req/core/Coordinate_Reference_System_Parameters
STATEMENT	Implementations shall allow the RDFS classes geosrs:AreaOfUse, geosrs:Extent, geosrs:GeographicBoundingBox, geosrs:AxesList, geosrs:SingleCRSList to be used in SPARQL graph patterns.

## 6.1.1. Class: geosrs:AreaOfUse

Table 1 — geosrs:AreaOfUse

URI	<a href="https://w3id.org/geosrs/srs/AreaOfUse">https://w3id.org/geosrs/srs/AreaOfUse</a>
Definition	Area within which a coordinate operation may be used.
Example	<code>geosrs:AreaOfUse</code>

## 6.1.2. Class: geosrs:Extent

Table 2 — geosrs:Extent

URI	<a href="https://w3id.org/geosrs/srs/Extent">https://w3id.org/geosrs/srs/Extent</a>
Definition	Geographic area or time interval in which the referring object is valid. Cf. ISO 19115-1:2014:2014-04, part 6.6.1 and table B.15 line 335.

## 6.1.3. Class: geosrs:GeographicBoundingBox

Table 3 — geosrs:GeographicBoundingBox

URI	<a href="https://w3id.org/geosrs/srs/GeographicBoundingBox">https://w3id.org/geosrs/srs/GeographicBoundingBox</a>
Definition	Frame delimiting an area of interest. See ISO 19115-1:2014:2014-04, part 6.6.1 and table B.15.1 line 344.



### 6.1.4. Class: geosrs:AxesList

Table 4 — geosrs:AxesList

URI	<a href="https://w3id.org/geosrs/srs/AxesList">https://w3id.org/geosrs/srs/AxesList</a>
Definition	Ordered list of coordinate system axes.

### 6.1.5. Class: geosrs:SingleCRSList

Table 5 — geosrs:SingleCRSList

URI	<a href="https://w3id.org/geosrs/srs/SingleCRSList">https://w3id.org/geosrs/srs/SingleCRSList</a>
Definition	Ordered list of simple reference coordinate systems.

## 6.2. Coordinate Reference System Properties

### REQUIREMENT 2: COORDINATE REFERENCE SYSTEM PROPERTIES

IDENTIFIER	/req/core/Coordinate_Reference_System_Properties
STATEMENT	Implementations shall allow the RDFS properties geosrs:baseCRS, geosrs:conversion, geosrs:coordinateSystem, geosrs:datum, geosrs:datumEnsemble, geosrs:domainOfValidity, geosrs:method, geocrs:asProj4, geocrs:asProjJSON, geocrs:asWKT, geosrs:EPSGcode to be used in SPARQL graph patterns.

### 6.2.1. Property: geosrs:baseCRS

Table 6 — geosrs:baseCRS

URI	<a href="https://w3id.org/geosrs/srs/baseCRS">https://w3id.org/geosrs/srs/baseCRS</a>
Type	<a href="#">owl:ObjectProperty</a>

Definition	The geodetic coordinate reference system on which a projected coordinate reference system is based. Cf. ISO 19111:2007:2007-07, table 11, association role base CRS.
Range	<a href="#"><u>GeodeticCRS</u></a>
Domain	<a href="#"><u>ProjectedCRS</u></a>

## 6.2.2. Property: geosrs:conversion

**Table 7** — geosrs:conversion

URI	<a href="https://w3id.org/geosrs/srs/conversion"><u>https://w3id.org/geosrs/srs/conversion</u></a>
Type	<a href="#"><u>owl:ObjectProperty</u></a>
Definition	The conversion used to define a projected coordinate reference system. Cf. ISO 19111:2007:2007-07, table 7, named association Definition.
Range	<a href="#"><u>Conversion</u></a>
Domain	<a href="#"><u>CRS</u></a>

## 6.2.3. Property: geosrs:coordinateSystem

**Table 8** — geosrs:coordinateSystem

URI	<a href="https://w3id.org/geosrs/srs/coordinateSystem"><u>https://w3id.org/geosrs/srs/coordinateSystem</u></a>
Type	<a href="#"><u>owl:ObjectProperty</u></a>
Definition	The property relates a coordinate reference system to its coordinate system
Range	<a href="#"><u>CoordinateSystem</u></a>
Domain	<a href="#"><u>CRS</u></a>
Example	<a href="#"><u>geosrs:coordinateSystem</u></a>

## 6.2.4. Property: geosrs:datum

**Table 9** — geosrs:datum

URI	<a href="https://w3id.org/geosrs/srs/datum">https://w3id.org/geosrs/srs/datum</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	The property relates a coordinate reference system to a datum
Range	<a href="#">Datum</a>
Domain	<a href="#">CRS</a>

## 6.2.5. Property: geosrs:datumEnsemble

**Table 10** — geosrs:datumEnsemble

URI	<a href="https://w3id.org/geosrs/srs/datumEnsemble">https://w3id.org/geosrs/srs/datumEnsemble</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	Indicates a single CRS referring to a collection of one or more datums (Datum Ensemble)
Range	<a href="#">DatumEnsemble</a>
Domain	<a href="#">SingleCRS</a>

## 6.2.6. Property: geosrs:domainOfValidity

**Table 11** — geosrs:domainOfValidity

URI	<a href="https://w3id.org/geosrs/srs/domainOfValidity">https://w3id.org/geosrs/srs/domainOfValidity</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	Geographic area or time interval in which the referring object is valid. Cf. ISO 19111:2007:2007-07, tables 4, 33 and 42, attribute domainOfValidity.

Range	<a href="#"><u>AreaOfUse</u></a>
Domain	<a href="#"><u>CRS</u></a>

## 6.2.7. Property: geosrs:method

**Table 12** — geosrs:method

URI	<a href="https://w3id.org/geosrs/srs/method"><u>https://w3id.org/geosrs/srs/method</u></a>
Type	<a href="#"><u>owl:ObjectProperty</u></a>
Range	<a href="#"><u>CoordinateOperation</u></a>
Domain	<a href="#"><u>CRS</u></a>

## 6.2.8. Property: geocrs:asProj4

**Table 13** — geocrs:asProj4

URI	geocrs:asProj4
Type	<a href="#"><u>owl:DatatypeProperty</u></a>
Definition	PROJ4 string defining a CRS. Note: this paradigm is ambiguous and presently considered outdated.
Range	<a href="#"><u>proj4Literal</u></a>
Domain	<a href="#"><u>CRS</u></a>

## 6.2.9. Property: geocrs:asProjJSON

**Table 14** — geocrs:asProjJSON

URI	geocrs:asProjJSON
Type	<a href="#"><u>owl:DatatypeProperty</u></a>

Definition	CRS definition encoded as a JSON object interpretable by PROJ4.
Range	<a href="#"><u>projJSONLiteral</u></a>
Domain	<a href="#"><u>CRS</u></a>

### 6.2.10. Property: geocrs:asWKT

**Table 15** — geocrs:asWKT

URI	geocrs:asWKT
Type	<a href="#"><u>owl:DatatypeProperty</u></a>
Definition	CRS definition encoded according to the Well Known Text structure. Cf. ISO 19162:2019.
Range	<a href="#"><u>wktLiteral</u></a>
Domain	<a href="#"><u>CRS</u></a>

### 6.2.11. Property: geosrs:EPSGcode

**Table 16** — geosrs:EPSGcode

URI	<a href="https://w3id.org/geosrs/srs/EPSGcode"><u>https://w3id.org/geosrs/srs/EPSGcode</u></a>
Type	<a href="#"><u>owl:DatatypeProperty</u></a>
Definition	Identifier of this resource in the EPSG Geodetic Parameter Dataset.
Range	<a href="#"><u>xsd:string</u></a>

## 6.3. Coordinate Reference System Types

---

## REQUIREMENT 3: COORDINATE REFERENCE SYSTEM TYPES

**IDENTIFIER** /req/core/Coordinate\_Reference\_System\_Types

**STATEMENT** Implementations shall allow the RDFS classes geosrs:BoundCRS, geosrs:CompoundCRS, geosrs:CRS, geosrs:EngineeringCRS, geosrs:GeocentricCRS, geosrs:GeodeticCRS, geosrs:GeographicCRS, geosrs:ParametricCRS, geosrs:ProjectedCRS, geosrs:SelenographicCRS, geosrs:ReferenceSystem, geosrs:SingleCRS, geosrs:SpatialReferenceSystem, geosrs:SpatioParametricCompoundCRS, geosrs:SpatioParametricTemporalCompoundCRS, geosrs:SpatioTemporalCompoundCRS, geosrs:StaticCRS, geosrs:TemporalCRS, geosrs:VerticalCRS to be used in SPARQL graph patterns.

Coordinate reference systems are typed according to their area of application, e.g. Geodetic vs. Engineering vs. TemporalCRS and by their ability to contain further

### 6.3.1. Class: geosrs:BoundCRS

**Table 17** — geosrs:BoundCRS

URI	<a href="https://w3id.org/geosrs/srs/BoundCRS">https://w3id.org/geosrs/srs/BoundCRS</a>
Super-classes	<a href="#">CRS</a>

### 6.3.2. Class: geosrs:CompoundCRS

**Table 18** — geosrs:CompoundCRS

URI	<a href="https://w3id.org/geosrs/srs/CompoundCRS">https://w3id.org/geosrs/srs/CompoundCRS</a>
Definition	Coordinate reference system using at least two independent single coordinate reference systems. Cf. ISO 19111:2007:2007-07, parts 8.2.3.c, 8.2.4, table 6 and annex B.1.2.4.
Super-classes	<a href="#">CRS</a>
Example	<a href="#">geosrs:CompoundCRS</a>

### 6.3.3. Class: geosrs:CRS

**Table 19** — geosrs:CRS

URI	<a href="https://w3id.org/geosrs/srs/CRS">https://w3id.org/geosrs/srs/CRS</a>
Definition	Depending on the spatial dimension of coordinates (1D, 2D, 3D), this piece of metadata is used for specifying the elements of definition associated to a given set of coordinates: its datum, its ellipsoid, its prime meridian, the type of coordinates (geocentric, geographic, projected,...), the coordinates units of measure, when appropriate the cartographic projection used, the vertical coordinate reference system.
Super-classes	<a href="#">SpatialReferenceSystem</a>

### 6.3.4. Class: geosrs:EngineeringCRS

**Table 20** — geosrs:EngineeringCRS

URI	<a href="https://w3id.org/geosrs/srs/EngineeringCRS">https://w3id.org/geosrs/srs/EngineeringCRS</a>
Definition	A contextually local coordinate reference system which can be divided into two broad categories: — earth-fixed systems applied to engineering activities on or near the surface of the earth; — CRSs on moving platforms such as road vehicles, vessels, aircraft or spacecraft.
Super-classes	<a href="#">CRS</a>

### 6.3.5. Class: geosrs:GeocentricCRS

**Table 21** — geosrs:GeocentricCRS

URI	<a href="https://w3id.org/geosrs/srs/GeocentricCRS">https://w3id.org/geosrs/srs/GeocentricCRS</a>
Definition	A cartesian coordinate reference system that represents locations in the vicinity of the Earth (including its surface, interior, atmosphere, and surrounding outer space) as X, Y, and Z measurements from its center of mass. Commonly used to track the orbits of satellites.
Super-classes	<a href="#">CRS</a>
Example	<a href="#">geosrs:GeocentricCRS</a>

### 6.3.6. Class: geosrs:GeodeticCRS

**Table 22** — geosrs:GeodeticCRS

URI	<a href="https://w3id.org/geosrs/srs/GeodeticCRS">https://w3id.org/geosrs/srs/GeodeticCRS</a>
Definition	Coordinate Reference System associated with a geodetic datum. Cf. ISO 19111:2007:2007-07, part 8.2.2.a, table 10 and annex B.1.2.1.a.
Super-classes	<a href="#">CRS</a>

### 6.3.7. Class: geosrs:GeographicCRS

**Table 23** — geosrs:GeographicCRS

URI	<a href="https://w3id.org/geosrs/srs/GeographicCRS">https://w3id.org/geosrs/srs/GeographicCRS</a>
Definition	Coordinate Reference System that has a geodetic reference frame and an ellipsoidal coordinate system
Super-classes	<a href="#">CRS</a>
Example	<a href="#">geosrs:GeographicCRS</a>

### 6.3.8. Class: geosrs:ParametricCRS

**Table 24** — geosrs:ParametricCRS

URI	<a href="https://w3id.org/geosrs/srs/ParametricCRS">https://w3id.org/geosrs/srs/ParametricCRS</a>
Definition	Coordinate Reference System based on a parametric datum
Super-classes	<a href="#">CRS</a>

### 6.3.9. Class: geosrs:ProjectedCRS



**Table 25** — geosrs:ProjectedCRS

URI	<a href="https://w3id.org/geosrs/srs/ProjectedCRS">https://w3id.org/geosrs/srs/ProjectedCRS</a>
Definition	Coordinate Reference System derived from a two-dimensional geodetic coordinate reference system by applying a map projection. Cf. ISO 19111:2007:2007-07, part 8.2.3.b, table 11 and annex B.1.2.3.
Super-classes	<a href="#">CRS</a>
Example	<a href="#">geosrs:ProjectedCRS</a>

### 6.3.10. Class: geosrs:SelenographicCRS

**Table 26** — geosrs:SelenographicCRS

URI	<a href="https://w3id.org/geosrs/srs/SelenographicCRS">https://w3id.org/geosrs/srs/SelenographicCRS</a>
Definition	Coordinate Reference System to refer locations on the surface of the Earth's Moon.
Super-classes	<a href="#">CRS</a>

### 6.3.11. Class: geosrs:ReferenceSystem

**Table 27** — geosrs:ReferenceSystem

URI	<a href="https://w3id.org/geosrs/srs/ReferenceSystem">https://w3id.org/geosrs/srs/ReferenceSystem</a>
Definition	An abstract coordinate system, whose origin, orientation and scale are specified in physical space. It is based on a set of reference points, defined as geometric points whose position is identified physically and mathematically.

### 6.3.12. Class: geosrs:SingleCRS

**Table 28** — geosrs:SingleCRS

URI	<a href="https://w3id.org/geosrs/srs/SingleCRS">https://w3id.org/geosrs/srs/SingleCRS</a>
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Definition	Coordinate reference system consisting of one coordinate system and one datum. Cf. ISO 19111:2007:2007-07, table 5.
Super-classes	<a href="#">CRS</a>

### 6.3.13. Class: geosrs:SpatialReferenceSystem

**Table 29** — geosrs:SpatialReferenceSystem

URI	<a href="https://w3id.org/geosrs/srs/SpatialReferenceSystem">https://w3id.org/geosrs/srs/SpatialReferenceSystem</a>
Definition	A spatial reference system (SRS) is a system for establishing spatial position. A spatial reference system can use geographic identifiers (place names, for example), coordinates (in which case it is a coordinate reference system), or identifiers with structured geometry (in which case it is a discrete global grid system).
Super-classes	<a href="#">ReferenceSystem</a>

### 6.3.14. Class: geosrs:SpatioParametricCompoundCRS

**Table 30** — geosrs:SpatioParametricCompoundCRS

URI	<a href="https://w3id.org/geosrs/srs/SpatioParametricCompoundCRS">https://w3id.org/geosrs/srs/SpatioParametricCompoundCRS</a>
Definition	A spatio-parametric coordinate reference system is a compound CRS in which one component is a geographic 2D, projected 2D or engineering 2D CRS, supplemented by a parametric CRS to create a three-dimensional CRS
Super-classes	<a href="#">CompoundCRS</a>

### 6.3.15. Class: geosrs:SpatioParametricTemporalCompoundCRS

**Table 31** — geosrs:SpatioParametricTemporalCompoundCRS

URI	<a href="https://w3id.org/geosrs/srs/SpatioParametricTemporalCompoundCRS">https://w3id.org/geosrs/srs/SpatioParametricTemporalCompoundCRS</a>
-----	---

Definition	Coordinate reference system combining a spatio-parametric reference system with at least one temporal reference system
Super-classes	<a href="#">SpatioParametricCompoundCRS</a>

### 6.3.16. Class: geosrs:SpatioTemporalCompoundCRS

**Table 32** — geosrs:SpatioTemporalCompoundCRS

URI	<a href="https://w3id.org/geosrs/srs/SpatioTemporalCompoundCRS">https://w3id.org/geosrs/srs/SpatioTemporalCompoundCRS</a>
Definition	Coordinate reference system combining a spatial reference system with at least one temporal reference system
Super-classes	<a href="#">CompoundCRS</a>

### 6.3.17. Class: geosrs:StaticCRS

**Table 33** — geosrs:StaticCRS

URI	<a href="https://w3id.org/geosrs/srs/StaticCRS">https://w3id.org/geosrs/srs/StaticCRS</a>
Definition	Coordinate Reference System that has a static reference frame
Super-classes	<a href="#">CRS</a>

### 6.3.18. Class: geosrs:TemporalCRS

**Table 34** — geosrs:TemporalCRS

URI	<a href="https://w3id.org/geosrs/srs/TemporalCRS">https://w3id.org/geosrs/srs/TemporalCRS</a>
Definition	Coordinate Reference System based on a temporal datum
Super-classes	<a href="#">CRS</a>

## 6.3.19. Class: geosrs:VerticalCRS

**Table 35** — geosrs:VerticalCRS

URI	<a href="https://w3id.org/geosrs/srs/VerticalCRS">https://w3id.org/geosrs/srs/VerticalCRS</a>
Definition	One-dimensional coordinate reference system associated with a vertical datum and used for recording heights or depths. Ellipsoidal heights are not captured in a vertical coordinate reference system but as part of a 3D coordinates tuple defined in a geodetic 3D coordinate reference system. Cf. ISO 19111:2007:2007-07, parts 8.2.2.b, table 14 and annex B.1.2.1.b.
Super-classes	<a href="#">CRS</a>
Example	<a href="#">geosrs:VerticalCRS</a>

7

# COORDINATE OPERATION MODULE

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## COORDINATE OPERATION MODULE

This clause establishes the **Co** Requirements class, with IRI `/req/co`, which has a corresponding Conformance Class, **Co**, with IRI `/conf/co`.

### REQUIREMENTS CLASS 2: 07-CO\_MODULE.ADOC EXTENSION

IDENTIFIER	<code>/req/co</code>
TARGET TYPE	Implementation Specification
CONFORMANCE CLASS	Conformance class A.2: <code>/conf/co</code>
REQUIREMENT	<code>/req/co/Coordinate_Operation_Methods</code>
	<code>/req/co/Coordinate_Operation_Parameters</code>
	<code>/req/co/Coordinate_Operation_Categories</code>
	<code>/req/co/Coordinate_Operation_Properties</code>

## 7.1. Coordinate Operation Categories

### REQUIREMENT 4: COORDINATE OPERATION CATEGORIES

IDENTIFIER	<code>/req/co/Coordinate_Operation_Categories</code>
STATEMENT	Implementations shall allow the RDFS classes <code>geosrs:GeographicObject</code> , <code>geosrs:RegisterOperations</code> , <code>geosrs:ScaleOperation</code> , <code>geosrs:RotationOperation</code> , <code>geosrs:IdentityOperation</code> , <code>geosrs:ShearOperation</code> , <code>geosrs:TranslationOperation</code> , <code>geosrs:AffineTransformationOperation</code> , <code>geosrs:CoordinateTransformationOperation</code> to be used in SPARQL graph patterns.

### 7.1.1. Class: `geosrs:GeographicObject`

Table 36 — `geosrs:GeographicObject`

URI	<a href="https://w3id.org/geosrs/co/GeographicObject">https://w3id.org/geosrs/co/GeographicObject</a>
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Definition	Identifier of a geographic feature of which the coordinates are used as operation parameters.
Super-classes	<a href="#">iso19107:Geometry[iso19107:Geometry]</a>

### 7.1.2. Class: geosrs:RegisterOperations

**Table 37** — geosrs:RegisterOperations

URI	<a href="https://w3id.org/geosrs/co/RegisterOperations">https://w3id.org/geosrs/co/RegisterOperations</a>
Definition	Operations supported in the Coordinate Operations package.

### 7.1.3. Class: geosrs:ScaleOperation

**Table 38** — geosrs:ScaleOperation

URI	<a href="https://w3id.org/geosrs/co/ScaleOperation">https://w3id.org/geosrs/co/ScaleOperation</a>
Definition	Scale transformation operation
Super-classes	<a href="#">AffineTransformationOperation</a>

### 7.1.4. Class: geosrs:RotationOperation

**Table 39** — geosrs:RotationOperation

URI	<a href="https://w3id.org/geosrs/co/RotationOperation">https://w3id.org/geosrs/co/RotationOperation</a>
Definition	Rotation transformation operation
Super-classes	<a href="#">AffineTransformationOperation</a>

### 7.1.5. Class: geosrs:IdentityOperation

**Table 40** — geosrs:IdentityOperation

URI	<a href="https://w3id.org/geosrs/co/IdentityOperation">https://w3id.org/geosrs/co/IdentityOperation</a>
Definition	Identity transformation operation
Super-classes	<a href="#">AffineTransformationOperation</a>

### 7.1.6. Class: geosrs:ShearOperation

**Table 41** — geosrs:ShearOperation

URI	<a href="https://w3id.org/geosrs/co/ShearOperation">https://w3id.org/geosrs/co/ShearOperation</a>
Definition	Shear transformation operation
Super-classes	<a href="#">AffineTransformationOperation</a>

### 7.1.7. Class: geosrs:TranslationOperation

**Table 42** — geosrs:TranslationOperation

URI	<a href="https://w3id.org/geosrs/co/TranslationOperation">https://w3id.org/geosrs/co/TranslationOperation</a>
Definition	Translation transformation operation
Super-classes	<a href="#">AffineTransformationOperation</a>

### 7.1.8. Class: geosrs:AffineTransformationOperation

**Table 43** — geosrs:AffineTransformationOperation

URI	<a href="https://w3id.org/geosrs/co/AffineTransformationOperation">https://w3id.org/geosrs/co/ AffineTransformationOperation</a>
Definition	Affine coordinate transformation operation
Super-classes	<a href="#">CoordinateTransformationOperation</a> []



### 7.1.9. Class: geocrs:CoordinateTransformationOperation

**Table 44** — geocrs:CoordinateTransformationOperation

URI	<code>geocrs:CoordinateTransformationOperation[]</code>
Definition	Coordinate operation in which the two coordinate reference systems are based on different datums.
Super-classes	<a href="#"><code>SingleOperation</code></a>

## 7.2. Coordinate Operation Methods

### REQUIREMENT 5: COORDINATE OPERATION METHODS

IDENTIFIER	<code>/req/co/Coordinate_Operation_Methods</code>
STATEMENT	Implementations shall allow the RDFS classes <code>geosrs:CoordinateOperation</code> , <code>geosrs:PassThroughOperation</code> , <code>geosrs:ConcatenatedOperation</code> , <code>geosrs:SingleOperation</code> , <code>geosrs:Transformation</code> , <code>geosrs:Conversion</code> , <code>geosrs:PointMotionOperation</code> , <code>geosrs:OperationMethod</code> to be used in SPARQL graph patterns.

### 7.2.1. Class: geosrs:PassThroughOperation

**Table 45** — geosrs:PassThroughOperation

URI	<a href="https://w3id.org/geosrs/co/PassThroughOperation">https://w3id.org/geosrs/co/PassThroughOperation</a>
Definition	Specification of a subset of coordinate tuples that is subject to a coordinate operation
Super-classes	<a href="#"><code>CoordinateOperation</code></a>

### 7.2.2. Class: geosrs:ConcatenatedOperation

**Table 46** — geosrs:ConcatenatedOperation

URI	<a href="https://w3id.org/geosrs/co/ConcatenatedOperation">https://w3id.org/geosrs/co/ConcatenatedOperation</a>
Definition	<p>Ordered sequence of two or more single coordinate operations. Note: The sequence of coordinate operations is constrained by the requirement that the source coordinate reference system of step (n + 1) shall be the same as the target coordinate reference system of step (n). The source coordinate reference system of the first step and the target coordinate reference system of the last step are the source and target coordinate reference system associated with the concatenated coordinate operation. For a concatenated coordinate operation sequence of n coordinate operations: source CRS (concatenated coordinate operation) .eq. source CRS (coordinate operation step 1) target CRS (coordinate operation step i) .eq. source CRS (coordinate operation step i + 1); i .eq. 1 ... (n - 1) target CRS (concatenated coordinate operation) .eq. target CRS (coordinate operation step n) Instead of a forward coordinate operation, an inverse coordinate operation may be used for one or more of the coordinate operation steps mentioned above, if the inverse coordinate operation is uniquely defined by the forward coordinate operation method.</p>
Super-classes	<a href="#">CoordinateOperation</a>

### 7.2.3. Class: geosrs:PointMotionOperation

**Table 47** — geosrs:PointMotionOperation

URI	<a href="https://w3id.org/geosrs/co/PointMotionOperation">https://w3id.org/geosrs/co/PointMotionOperation</a>
Definition	<p>Mathematical operation that describes the change of coordinate values within one coordinate reference system due to the motion of the point between one coordinate epoch and another coordinate epoch Note: In this document the motion is due to tectonic plate movement or deformation.</p>
Super-classes	<a href="#">SingleOperation</a>

## 7.3. Coordinate Operation Parameters

### REQUIREMENT 6: COORDINATE OPERATION PARAMETERS

IDENTIFIER	/req/co/Coordinate_Operation_Parameters
STATEMENT	Implementations shall allow the RDFS classes geosrs:GeneralOperationParameter, geosrs:OperationParameterGroup, geosrs:OperationParameter, geosrs:GeneralParameterValue, geosrs:ParameterValueGroup, geosrs:OperationParameterValue to be used in SPARQL graph patterns.

#### 7.3.1. Class: geosrs:OperationParameterGroup

Table 48 — geosrs:OperationParameterGroup

URI	<a href="https://w3id.org/geosrs/co/OperationParameterGroup">https://w3id.org/geosrs/co/OperationParameterGroup</a>
Definition	Definition of a group of related parameters used by a coordinate operation method.
Super-classes	<a href="#">GeneralOperationParameter</a>

#### 7.3.2. Class: geosrs:ParameterValueGroup

Table 49 — geosrs:ParameterValueGroup

URI	<a href="https://w3id.org/geosrs/co/ParameterValueGroup">https://w3id.org/geosrs/co/ParameterValueGroup</a>
Definition	Group of related parameter values. Note: The same group can be repeated more than once in a coordinate operation or higher level ParameterValueGroup, if those instances contain different values of one or more ParameterValues which suitably distinguish among those groups.
Super-classes	<a href="#">GeneralParameterValue</a>

# 7.4. Coordinate Operation Properties

Requirement 7: Coordinate Operation Properties	
IDENTIFIER	/req/co/Coordinate_Operation_Properties
STATEMENT	Implementations shall allow the RDFS properties geosrs:derivingConversion, geosrs:parameter, geosrs:sourceCRS, geosrs:targetCRS to be used in SPARQL graph patterns.

## 7.4.1. Property: geosrs:derivingConversion

Table 50 — geosrs:derivingConversion

URI	<a href="https://w3id.org/geosrs/co/derivingConversion">https://w3id.org/geosrs/co/derivingConversion</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	Relates a derived CRS to a conversion
Range	<a href="#">Conversion</a>
Domain	<a href="#">DerivedCRS</a>

## 7.4.2. Property: geosrs:parameter

Table 51 — geosrs:parameter

URI	<a href="https://w3id.org/geosrs/co/parameter">https://w3id.org/geosrs/co/parameter</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	Value of the datum-defining parameter
Range	<a href="#">OperationParameter</a>
Domain	<a href="#">Conversion</a>

### 7.4.3. Property: geosrs:sourceCRS

**Table 52** — geosrs:sourceCRS

URI	<a href="https://w3id.org/geosrs/co/sourceCRS">https://w3id.org/geosrs/co/sourceCRS</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	The coordinate reference system associated to the data used as input of a given operation. Cf. ISO 19111:2007:2007-07, table 42, named association Source.
Range	<a href="#">CRS</a>
Domain	<a href="#">CoordinateOperation</a>
Example	<a href="#">geosrs:sourceCRS</a>

### 7.4.4. Property: geosrs:targetCRS

**Table 53** — geosrs:targetCRS

URI	<a href="https://w3id.org/geosrs/co/targetCRS">https://w3id.org/geosrs/co/targetCRS</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	The coordinate reference system associated to the data obtained as output of a given operation. Cf. ISO 19111:2007:2007-07, table 42, named association Target.
Range	<a href="#">CRS</a>
Domain	<a href="#">CoordinateOperation</a>



8

# COORDINATE SYSTEM MODULE

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This clause establishes the **CS** Requirements class, with IRI `/req/cs`, which has a corresponding Conformance Class, **CS**, with IRI `/conf/cs`.

The coordinate system module introduces different types of coordinate systems which are distinguished in geospatial science and applications. Coordinate systems are distinguished by their area of use, i.e planetary or interstellar and by their multidimensionality.

## REQUIREMENTS CLASS 3: 08-CS\_MODULE.ADOC EXTENSION

IDENTIFIER	<code>/req/cs</code>
TARGET TYPE	Implementation Specification
CONFORMANCE CLASS	Conformance class A.3: <code>/conf/cs</code>
REQUIREMENT	<code>/req/cs/Temporal_Coordinate_Systems</code>
	<code>/req/cs/3D_Coordinate_Systems</code>
	<code>/req/cs/Coordinate_System_Types</code>
	<code>/req/cs/Celestial_Coordinate_Systems</code>
	<code>/req/cs/Coordinate_System_Components</code>
	<code>/req/cs/Coordinate_System_Properties</code>

## 8.1. 3D Coordinate Systems

### REQUIREMENT 8: 3D COORDINATE SYSTEMS

IDENTIFIER	<code>/req/cs/3D_Coordinate_Systems</code>
STATEMENT	Implementations shall allow the RDFS classes <code>geosrs:3DCoordinateSystem</code> , <code>geosrs:ConicalCoordinateSystem</code> , <code>geosrs:CylindricalCoordinateSystem</code> , <code>geosrs:EllipsoidalCoordinateSystem</code> , <code>geosrs:SphericalCoordinateSystem</code> to be used in SPARQL graph patterns.

### 8.1.1. Class: geosrs:3DCoordinateSystem

The class geosrs:3DCoordinateSystem describes a coordinate system in three dimesions. These coordinate systems are common for 3D representations or 2D representations with a time aspect.

**Table 54** — geosrs:3DCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/3DCoordinateSystem">https://w3id.org/geosrs/cs/3DCoordinateSystem</a>
Definition	Non-repeating sequence of coordinate system axes that spans a given coordinate space in three dimensions
Super-classes	<a href="#">CoordinateSystem</a>
Example	<a href="#">geosrs:3DCoordinateSystem</a>

### 8.1.2. Class: geosrs:ConicalCoordinateSystem

**Table 55** — geosrs:ConicalCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/ConicalCoordinateSystem">https://w3id.org/geosrs/cs/ConicalCoordinateSystem</a>
Definition	A conical coordinate system is a three-dimensional orthogonal coordinate system consisting of concentric spheres (described by their radius $r$ ) and by two families of perpendicular cones, aligned along the $z$ - and $x$ -axes, respectively
Super-classes	<a href="#">OrthogonalCoordinateSystem</a>

### 8.1.3. Class: geosrs:CylindricalCoordinateSystem

**Table 56** — geosrs:CylindricalCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/CylindricalCoordinateSystem">https://w3id.org/geosrs/cs/CylindricalCoordinateSystem</a>
Definition	Three-dimensional coordinate system in Euclidean space in which position is specified by two linear coordinates and one angular coordinate



## 8.2. Celestial Coordinate Systems

### REQUIREMENT 9: CELESTIAL COORDINATE SYSTEMS

**IDENTIFIER**      `/req/cs/Celestial_Coordinate_Systems`

**STATEMENT**

Implementations shall allow the RDFS classes `geosrs:CelestialCoordinateSystem`, `geosrs:EclipticCoordinateSystem`, `geosrs:EquatorialCoordinateSystem`, `geosrs:GalacticCoordinateSystem`, `geosrs:HorizontalCoordinateSystem`, `geosrs:PerifocalCoordinateSystem`, `geosrs:SuperGalacticCS` to be used in SPARQL graph patterns.

### 8.2.1. Class: `geosrs:CelestialCoordinateSystem`

**Table 57** — `geosrs:CelestialCoordinateSystem`

URI	<a href="https://w3id.org/geosrs/cs/CelestialCoordinateSystem">https://w3id.org/geosrs/cs/CelestialCoordinateSystem</a>
Definition	A coordinate system for specifying positions of celestial objects relative to physical reference points
Super-classes	<a href="#">CoordinateSystem</a>

### 8.2.2. Class: `geosrs:EclipticCoordinateSystem`

**Table 58** — `geosrs:EclipticCoordinateSystem`

URI	<a href="https://w3id.org/geosrs/cs/EclipticCoordinateSystem">https://w3id.org/geosrs/cs/EclipticCoordinateSystem</a>
Definition	An ecliptic coordinate system is used for representing the apparent positions and orbits of solar system objects.
Super-classes	<a href="#">CelestialCoordinateSystem</a>

### 8.2.3. Class: `geosrs:EquatorialCoordinateSystem`

**Table 59** — geosrs:EquatorialCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/EquatorialCoordinateSystem">https://w3id.org/geosrs/cs/EquatorialCoordinateSystem</a>
Definition	A celestial coordinate system in which an object's position on the celestial sphere is described in terms of its north-south declination and east-west right ascension, measured relative to the celestial equator and vernal equinox, respectively.
Super-classes	<a href="#">CelestialCoordinateSystem</a>

## 8.2.4. Class: geosrs:GalacticCoordinateSystem

**Table 60** — geosrs:GalacticCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/GalacticCoordinateSystem">https://w3id.org/geosrs/cs/GalacticCoordinateSystem</a>
Definition	A coordinate system with the Sun as its center, the primary direction aligned with the approximate center of the Milky Way Galaxy, and the fundamental plane parallel to an approximation of the galactic plane but offset to its north.
Super-classes	<a href="#">CelestialCoordinateSystem</a> <a href="#">3DCoordinateSystem</a>

## 8.2.5. Class: geosrs:HorizontalCoordinateSystem

**Table 61** — geosrs:HorizontalCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/HorizontalCoordinateSystem">https://w3id.org/geosrs/cs/HorizontalCoordinateSystem</a>
Definition	A horizontal coordinate system is a celestial coordinate system that uses the observer's local horizon as the fundamental plane.
Super-classes	<a href="#">CelestialCoordinateSystem</a>

## 8.2.6. Class: geosrs:PerifocalCoordinateSystem

**Table 62** — geosrs:PerifocalCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/PerifocalCoordinateSystem">https://w3id.org/geosrs/cs/PerifocalCoordinateSystem</a>
Definition	A frame of reference centered at the focus of the orbit, i. e. the celestial body about which the orbit is centered.
Super-classes	<a href="#">CelestialCoordinateSystem</a>

### 8.2.7. Class: geosrs:SuperGalacticCS

**Table 63** — geosrs:SuperGalacticCS

URI	<a href="https://w3id.org/geosrs/cs/SuperGalacticCS">https://w3id.org/geosrs/cs/SuperGalacticCS</a>
Definition	A reference frame for the supercluster of galaxies that contains the Milky Way galaxy, referenced to a local relatively flat collection of galaxy clusters used to define the supergalactic plane.
Super-classes	<a href="#">CelestialCoordinateSystem</a> <a href="#">3DCoordinateSystem</a>

## 8.3. Coordinate System Components

### REQUIREMENT 10: COORDINATE SYSTEM COMPONENTS

IDENTIFIER	/req/cs/Coordinate_System_Components
STATEMENT	Implementations shall allow the RDFS classes geosrs:CoordinateSystemAxis to be used in SPARQL graph patterns.

## 8.4. Coordinate System Properties

### REQUIREMENT 11: COORDINATE SYSTEM PROPERTIES

IDENTIFIER	/req/cs/Coordinate_System_Properties
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## REQUIREMENT 11: COORDINATE SYSTEM PROPERTIES

### STATEMENT

Implementations shall allow the RDFS properties `geosrs:axis`, `geosrs:axisDirection` to be used in SPARQL graph patterns.

### 8.4.1. Property: `geosrs:axis`

Table 64 — `geosrs:axis`

URI	<a href="https://w3id.org/geosrs/cs/axis">https://w3id.org/geosrs/cs/axis</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	The property relates a coordinate system to one of its axis
Range	<a href="#">Axis</a>
Domain	<a href="#">CoordinateSystem</a>

### 8.4.2. Property: `geosrs:axisDirection`

Table 65 — `geosrs:axisDirection`

URI	<a href="https://w3id.org/geosrs/cs/axisDirection">https://w3id.org/geosrs/cs/axisDirection</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	The direction of an axis. Cf. ISO 19111:2007:2007-07, table 27, attribute coordinate system axis direction.
Range	<a href="#">AxisDirection</a>
Domain	<a href="#">Axis</a>
Example	<a href="#">geosrs:axisDirection</a>

## 8.5. Coordinate System Types

## REQUIREMENT 12: COORDINATE SYSTEM TYPES

**IDENTIFIER** /req/cs/Coordinate\_System\_Types

**STATEMENT**

Implementations shall allow the RDFS classes `geosrs:CoordinateSystem`, `geosrs:AffineCoordinateSystem`, `geosrs:BarycentricCoordinateSystem`, `geosrs:CartesianCoordinateSystem`, `geosrs:CurvilinearCoordinateSystem`, `geosrs:EngineeringCoordinateSystem`, `geosrs:GeodeticCoordinateSystem`, `geosrs:GeographicalCoordinateSystem`, `geosrs:GridCoordinateSystem`, `geosrs:HexagonalCoordinateSystem`, `geosrs:LocalCoordinateSystem`, `geosrs:ObliqueCoordinateSystem`, `geosrs:OrdinalCoordinateSystem`, `geosrs:OrthogonalCoordinateSystem`, `geosrs:ParametricCoordinateSystem`, `geosrs:PlanarCoordinateSystem`, `geosrs:PolarCoordinateSystem`, `geosrs:VerticalCoordinateSystem` to be used in SPARQL graph patterns.

### 8.5.1. Class: `geosrs:AffineCoordinateSystem`

**Table 66** — `geosrs:AffineCoordinateSystem`

URI	<a href="https://w3id.org/geosrs/cs/AffineCoordinateSystem">https://w3id.org/geosrs/cs/AffineCoordinateSystem</a>
Definition	Coordinate system in Euclidean space with straight axes that are not necessarily mutually perpendicular
Super-classes	<a href="#"><code>CoordinateSystem</code></a>

### 8.5.2. Class: `geosrs:BarycentricCoordinateSystem`

**Table 67** — `geosrs:BarycentricCoordinateSystem`

URI	<a href="https://w3id.org/geosrs/cs/BarycentricCoordinateSystem">https://w3id.org/geosrs/cs/BarycentricCoordinateSystem</a>
Definition	A coordinate system in which the location of a point is specified by reference to a simplex (a triangle for points in a plane, a tetrahedron for points in three-dimensional space, etc.)
Super-classes	<a href="#"><code>CoordinateSystem</code></a>

### 8.5.3. Class: `geosrs:CurvilinearCoordinateSystem`

**Table 68** — geosrs:CurvilinearCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/CurvilinearCoordinateSystem">https://w3id.org/geosrs/cs/CurvilinearCoordinateSystem</a>
Definition	A coordinate system for the Euclidean space in which the coordinate lines may be curved
Super-classes	<a href="#">CoordinateSystem</a>

### 8.5.4. Class: geosrs:EngineeringCoordinateSystem

**Table 69** — geosrs:EngineeringCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/EngineeringCoordinateSystem">https://w3id.org/geosrs/cs/EngineeringCoordinateSystem</a>
Definition	Coordinate system used by an engineering coordinate reference system, one of an affine coordinate system, a Cartesian coordinate system, a cylindrical coordinate system, a linear coordinate sytem, an ordinal coordinate system, a polar coordinate system or a spherical coordinate system
Super-classes	<a href="#">CoordinateSystem</a>

### 8.5.5. Class: geosrs:GeodeticCoordinateSystem

**Table 70** — geosrs:GeodeticCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/GeodeticCoordinateSystem">https://w3id.org/geosrs/cs/GeodeticCoordinateSystem</a>
Definition	Coordinate system used by a Geodetic CRS, one of a Cartesian coordinate system or a spherical coordinate system.
Super-classes	<a href="#">CoordinateSystem</a>

### 8.5.6. Class: geosrs:GeographicalCoordinateSystem

**Table 71** — geosrs:GeographicalCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/GeographicalCoordinateSystem">https://w3id.org/geosrs/cs/GeographicalCoordinateSystem</a>
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Definition	Spherical or geodetic coordinate system for measuring and communicating positions directly on Earth as latitude and longitude.
Super-classes	<a href="#">SphericalCoordinateSystem</a> <a href="#">GeodeticCoordinateSystem</a>

### 8.5.7. Class: geosrs:GridCoordinateSystem

**Table 72** — geosrs:GridCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/GridCoordinateSystem">https://w3id.org/geosrs/cs/GridCoordinateSystem</a>
Definition	A grid coordinate system identifies areas within a grid.
Super-classes	<a href="#">CoordinateSystem</a>

### 8.5.8. Class: geosrs:HexagonalCoordinateSystem

**Table 73** — geosrs:HexagonalCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/HexagonalCoordinateSystem">https://w3id.org/geosrs/cs/HexagonalCoordinateSystem</a>
Definition	A hexagonal coordinate system identifies areas within a hexagonal lattice.
Super-classes	<a href="#">GridCoordinateSystem</a>

### 8.5.9. Class: geosrs:LocalCoordinateSystem

**Table 74** — geosrs:LocalCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/LocalCoordinateSystem">https://w3id.org/geosrs/cs/LocalCoordinateSystem</a>
Definition	Coordinate system with a point of local reference.
Super-classes	<a href="#">CoordinateSystem</a>

## 8.5.10. Class: geosrs:ObliqueCoordinateSystem

**Table 75** — geosrs:ObliqueCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/ObliqueCoordinateSystem">https://w3id.org/geosrs/cs/ObliqueCoordinateSystem</a>
Definition	A plane coordinate system whose axes are not perpendicular.
Super-classes	<a href="#">CoordinateSystem</a>

## 8.5.11. Class: geosrs:OrthogonalCoordinateSystem

**Table 76** — geosrs:OrthogonalCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/OrthogonalCoordinateSystem">https://w3id.org/geosrs/cs/OrthogonalCoordinateSystem</a>
Definition	A orthogonal coordinate system is a system of curvilinear coordinates in which each family of surfaces intersects the others at right angles.
Super-classes	<a href="#">CurvilinearCoordinateSystem</a>

## 8.5.12. Class: geosrs:PlanarCoordinateSystem

**Table 77** — geosrs:PlanarCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/PlanarCoordinateSystem">https://w3id.org/geosrs/cs/PlanarCoordinateSystem</a>
Definition	A two-dimensional measurement system that locates features on a plane based on their distance from an origin (0,0) along two perpendicular axes.
Super-classes	<a href="#">CoordinateSystem</a>
Example	<a href="#">geosrs:PlanarCoordinateSystem</a>



## 8.6. Temporal Coordinate Systems

### REQUIREMENT 13: TEMPORAL COORDINATE SYSTEMS

**IDENTIFIER**      `/req/cs/Temporal_Coordinate_Systems`

**STATEMENT**

Implementations shall allow the RDFS classes `geosrs:1DCoordinateSystem`, `geosrs:DateTimeTemporalCoordinateSystem`, `geosrs:TemporalCountCoordinateSystem`, `geosrs:TemporalCoordinateSystem`, `geosrs:TemporalMeasureCoordinateSystem` to be used in SPARQL graph patterns.

#### 8.6.1. Class: `geosrs:1DCoordinateSystem`

The class `geosrs:1DCoordinateSystem` describes a coordinate system with only one dimension. Often, these definitions include temporal coordinate systems which only represent time using one coordinate system axis.

**Table 78** — `geosrs:1DCoordinateSystem`

URI	<a href="https://w3id.org/geosrs/cs/1DCoordinateSystem">https://w3id.org/geosrs/cs/1DCoordinateSystem</a>
Definition	Non-repeating sequence of coordinate system axes that spans a given coordinate space in one dimension
Super-classes	<a href="#">CoordinateSystem</a>

#### 8.6.2. Class: `geosrs:DateTimeTemporalCoordinateSystem`

**Table 79** — `geosrs:DateTimeTemporalCoordinateSystem`

URI	<a href="https://w3id.org/geosrs/cs/DateTimeTemporalCoordinateSystem">https://w3id.org/geosrs/cs/DateTimeTemporalCoordinateSystem</a>
Definition	One-dimensional coordinate system used to record time in <code>dateTime</code> representation as defined in ISO 8601.
Super-classes	<a href="#">TemporalCoordinateSystem</a>

### 8.6.3. Class: geosrs:TemporalCountCoordinateSystem

**Table 80** — geosrs:TemporalCountCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/TemporalCountCoordinateSystem">https://w3id.org/geosrs/cs/TemporalCountCoordinateSystem</a>
Definition	One-dimensional coordinate system used to record time as an integer count.
Super-classes	<a href="#">TemporalCoordinateSystem</a>

### 8.6.4. Class: geosrs:TemporalCoordinateSystem

**Table 81** — geosrs:TemporalCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/TemporalCoordinateSystem">https://w3id.org/geosrs/cs/TemporalCoordinateSystem</a>
Definition	One-dimensional coordinate system where the axis is time.
Super-classes	<a href="#">1DCoordinateSystem</a>

### 8.6.5. Class: geosrs:TemporalMeasureCoordinateSystem

**Table 82** — geosrs:TemporalMeasureCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/TemporalMeasureCoordinateSystem">https://w3id.org/geosrs/cs/TemporalMeasureCoordinateSystem</a>
Definition	One-dimensional coordinate system used to record a time as a real number.
Super-classes	<a href="#">TemporalCoordinateSystem</a>

9

# DATUM MODULE

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This clause establishes the **Datum** Requirements class, with IRI `/req/datum`, which has a corresponding Conformance Class, **Datum**, with IRI `/conf/datum`.

#### REQUIREMENTS CLASS 4: 09-DATUM\_MODULE.ADOC EXTENSION

IDENTIFIER	<code>/req/datum</code>
TARGET TYPE	Implementation Specification
CONFORMANCE CLASS	Conformance class A.4: <code>/conf/datum</code>
REQUIREMENT	<code>/req/datum/Datum_Types</code>
	<code>/req/datum/Datum_Parameters</code>
	<code>/req/datum/Spheroid_Types</code>
	<code>/req/datum/Datum_Properties</code>
	<code>/req/datum/Spheroid_Properties</code>

## 9.1. Datum Parameters

#### REQUIREMENT 14: DATUM PARAMETERS

IDENTIFIER	<code>/req/datum/Datum_Parameters</code>
STATEMENT	Implementations shall allow the RDFS classes <code>geosrs:PrimeMeridian</code> , <code>geosrs:DefiningParameter</code> to be used in SPARQL graph patterns.

### 9.1.1. Class: `geosrs:DefiningParameter`

Table 83 — `geosrs:DefiningParameter`

URI	<a href="https://w3id.org/geosrs/datum/DefiningParameter">https://w3id.org/geosrs/datum/DefiningParameter</a>
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Definition	Parameter value, an ordered sequence of values, or a reference to a file of parameter values that define a paramtric datum. Cf. ISO 19111:2019 Geographic information — Referencing by coordinates.
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## 9.2. Datum Properties

Requirement 15: Datum Properties	
IDENTIFIER	/req/datum/Datum_Properties
STATEMENT	Implementations shall allow the RDFS properties geosrs:datumDefiningParameter, geosrs:ellipsoid, geosrs:primeMeridian to be used in SPARQL graph patterns.

### 9.2.1. Property: geosrs:datumDefiningParameter

Table 84 — geosrs:datumDefiningParameter

URI	<a href="https://w3id.org/geosrs/datum/datumDefiningParameter">https://w3id.org/geosrs/datum/datumDefiningParameter</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	Parameter used to define the parametric datum
Range	<a href="#">DefiningParameter</a>
Domain	<a href="#">ParametricDatum</a>

### 9.2.2. Property: geosrs:ellipsoid

Table 85 — geosrs:ellipsoid

URI	<a href="https://w3id.org/geosrs/datum/ellipsoid">https://w3id.org/geosrs/datum/ellipsoid</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	The properties relates a datum to its ellipsoid definition

Range	<a href="#">Ellipsoid</a>
Domain	<a href="#">Datum</a>
Example	<a href="#">geosrs:ellipsoid</a>

### 9.2.3. Property: geosrs:primeMeridian

**Table 86** — geosrs:primeMeridian

URI	<a href="https://w3id.org/geosrs/datum/primeMeridian">https://w3id.org/geosrs/datum/primeMeridian</a>
Type	<a href="#">owl:ObjectProperty</a>
Definition	The prime meridian used by a geodetic datum. Cf. ISO 19111:2007:2007-07, table 34, association role prime Meridian.
Range	<a href="#">PrimeMeridian</a>
Domain	<a href="#">Datum</a>
Example	<a href="#">geosrs:primeMeridian</a>

## 9.3. Datum Types

### REQUIREMENT 16: DATUM TYPES

**IDENTIFIER** /req/datum/Datum\_Types

**STATEMENT**

Implementations shall allow the RDFS classes geosrs:Datum, geosrs:GeodeticDatum, geosrs:DynamicGeodeticReferenceFrame, geosrs:VerticalDatum, geosrs:DynamicVerticalDatum, geosrs:ParametricDatum, geosrs:EngineeringDatum, geosrs:TemporalDatum, geosrs:DatumEnsemble to be used in SPARQL graph patterns.

#### 9.3.1. Class: geosrs:DynamicGeodeticReferenceFrame

**Table 87** — geosrs:DynamicGeodeticReferenceFrame

URI	<a href="https://w3id.org/geosrs/datum/DynamicGeodeticReferenceFrame">https://w3id.org/geosrs/datum/DynamicGeodeticReferenceFrame</a>
Definition	Geodetic reference frame in which some of the parameters describe time evolution of defining station coordinates Example: defining station coordinates having linear velocities to account for crustal motion.
Super-classes	<a href="#">GeodeticDatum</a>

### 9.3.2. Class: geosrs:DynamicVerticalDatum

**Table 88** — geosrs:DynamicVerticalDatum

URI	<a href="https://w3id.org/geosrs/datum/DynamicVerticalDatum">https://w3id.org/geosrs/datum/DynamicVerticalDatum</a>
Definition	Vertical reference frame in which some of the defining parameters have time dependency Example: Defining station heights have velocity to account for post-glacial isostatic rebound motion. Cf. ISO 19111:2019 Geographic information — Referencing by coordinates.
Super-classes	<a href="#">VerticalDatum</a>
Example	<a href="#">geosrs:DynamicVerticalDatum</a>

### 9.3.3. Class: geosrs:ParametricDatum

**Table 89** — geosrs:ParametricDatum

URI	<a href="https://w3id.org/geosrs/datum/ParametricDatum">https://w3id.org/geosrs/datum/ParametricDatum</a>
Definition	Textual description and/or a set of parameters identifying a particular reference surface used as the origin of a parametric coordinate system, including its position with respect to the Earth. Cf. ISO 19111:2019 Geographic information — Referencing by coordinates.
Super-classes	<a href="#">Datum</a>

### 9.3.4. Class: geosrs:EngineeringDatum

**Table 90** — geosrs:EngineeringDatum

URI	<a href="https://w3id.org/geosrs/datum/EngineeringDatum">https://w3id.org/geosrs/datum/EngineeringDatum</a>
Definition	Definition of the origin and orientation of an engineering coordinate reference systemNote: The origin can be fixed with respect to the Earth (such as a defined point at a construction site), or be a defined point on a moving vehicle (such as on a ship or satellite), or a defined point of an image. Cf. ISO 19111:2019 Geographic information — Referencing by coordinates.
Super-classes	<a href="#">Datum</a>

### 9.3.5. Class: geosrs:TemporalDatum

**Table 91** — geosrs:TemporalDatum

URI	<a href="https://w3id.org/geosrs/datum/TemporalDatum">https://w3id.org/geosrs/datum/TemporalDatum</a>
Definition	Definition of the relationship of a temporal coordinate system to an objectNote: The object is normally time on the Earth. Cf. ISO 19111:2019 Geographic information — Referencing by coordinates.
Super-classes	<a href="#">Datum</a>

### 9.3.6. Class: geosrs:DatumEnsemble

**Table 92** — geosrs:DatumEnsemble

URI	<a href="https://w3id.org/geosrs/datum/DatumEnsemble">https://w3id.org/geosrs/datum/DatumEnsemble</a>
Definition	A collection of two or more datums (or if geodetic or vertical, a collection of two or more reference frames) that are realizations of one Conventional Reference System and which for all but the highest accuracy requirements may be considered to be insignificantly different from each other. Note: Within the datum ensemble every frame or datum is constrained to be



a realization of the same reference system. Cf. ISO 19111:2019 Geographic information — Referencing by coordinates.

## 9.4. Spheroid Properties

### REQUIREMENT 17: SPHEROID PROPERTIES

IDENTIFIER	/req/datum/Spheroid_Properties
STATEMENT	Implementations shall allow the RDFS properties geosrs:eccentricity, geosrs:inverseFlattening, geosrs:isSphere, geosrs:semiMajorAxis, geosrs:semiMinorAxis to be used in SPARQL graph patterns.

#### 9.4.1. Property: geosrs:eccentricity

Table 93 — geosrs:eccentricity

URI	<a href="https://w3id.org/geosrs/datum/eccentricity">https://w3id.org/geosrs/datum/eccentricity</a>
Type	<a href="#">owl:DatatypeProperty</a>
Definition	A measure of how much an ellipse deviates from a perfect circle.
Range	<a href="#">xsd:double</a>
Domain	<a href="#">Ellipsoid</a>
Example	<a href="#">geosrs:eccentricity</a>

#### 9.4.2. Property: geosrs:inverseFlattening

Table 94 — geosrs:inverseFlattening

URI	<a href="https://w3id.org/geosrs/datum/inverseFlattening">https://w3id.org/geosrs/datum/inverseFlattening</a>
Type	<a href="#">owl:DatatypeProperty</a>

Definition	Indicates the inverse flattening value of an ellipsoid, expressed as a number or a ratio (percentage rate, parts per million, etc.). Cf. ISO 19111:2007:2007-07, table 37, attribute inverse flattening
Range	<a href="#"><u>xsd:double</u></a>
Domain	<a href="#"><u>Ellipsoid</u></a>
Example	<a href="#"><u>geosrs:inverseFlattening</u></a>

### 9.4.3. Property: geosrs:isSphere

**Table 95** — geosrs:isSphere

URI	<a href="https://w3id.org/geosrs/datum/isSphere"><u>https://w3id.org/geosrs/datum/isSphere</u></a>
Type	<a href="#"><u>owl:DatatypeProperty</u></a>
Definition	Indicates whether the ellipsoid is a sphere. Cf. ISO 19111:2007:2007-07, table 37, attribute ellipsoid=sphere indicator.
Range	<a href="#"><u>xsd:boolean</u></a>
Domain	<a href="#"><u>Ellipsoid</u></a>
Example	<a href="#"><u>geosrs:isSphere</u></a>

### 9.4.4. Property: geosrs:semiMajorAxis

**Table 96** — geosrs:semiMajorAxis

URI	<a href="https://w3id.org/geosrs/datum/semiMajorAxis"><u>https://w3id.org/geosrs/datum/semiMajorAxis</u></a>
Type	<a href="#"><u>owl:DatatypeProperty</u></a>
Definition	Indicates the length of the semi major axis of an ellipsoid. Cf. ISO 19111:2007:2007-07, table 36, attribute length of semi-major axis.
Range	<a href="#"><u>xsd:double</u></a>

Domain	<a href="#">Ellipsoid</a>
Example	<a href="#">geosrs:semiMajorAxis</a>

### 9.4.5. Property: geosrs:semiMinorAxis

**Table 97** — geosrs:semiMinorAxis

URI	<a href="https://w3id.org/geosrs/datum/semiMinorAxis">https://w3id.org/geosrs/datum/semiMinorAxis</a>
Type	<a href="#">owl:DatatypeProperty</a>
Definition	Indicates the length of the semi minor axis of an ellipsoid. Cf. ISO 19111:2007:2007-07, table 37, attribute length of semi-minor axis.
Range	<a href="#">xsd:double</a>
Domain	<a href="#">Ellipsoid</a>
Example	<a href="#">geosrs:semiMinorAxis</a>

## 9.5. Spheroid Types

### REQUIREMENT 18: SPHEROID TYPES

IDENTIFIER	/req/datum/Spheroid_Types
STATEMENT	Implementations shall allow the RDFS classes geosrs:Ellipsoid, geosrs:TriaxialEllipsoid to be used in SPARQL graph patterns.

### 9.5.1. Class: geosrs:TriaxialEllipsoid

**Table 98** — geosrs:TriaxialEllipsoid

URI	<a href="https://w3id.org/geosrs/datum/TriaxialEllipsoid">https://w3id.org/geosrs/datum/TriaxialEllipsoid</a>
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Definition

Surface of an analytic ellipsoid defined by three axes of different length. Also referred as scalene ellipsoid.

10

# SRS APPLICATION MODULE

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## SRS APPLICATION MODULE

This clause establishes the **SRSAPP** Requirements class, with IRI `/req/srsapp`, which has a corresponding Conformance Class, **SRSAPP**, with IRI `/conf/srsapp`.

### REQUIREMENTS CLASS 5: 10-SRSAPPLICATION\_MODULE.ADOC EXTENSION

IDENTIFIER	<code>/req/srsapplication</code>
TARGET TYPE	Implementation Specification
CONFORMANCE CLASS	Conformance class A.5: <code>/conf/srsapplication</code>
REQUIREMENT	<code>/req/srsapplication/SRS_Application_Types</code>
	<code>/req/srsapplication/Map_Types</code>

## 10.1. Map Types

### REQUIREMENT 19: MAP TYPES

IDENTIFIER	<code>/req/srsapplication/Map_Types</code>
STATEMENT	Implementations shall allow the RDFS classes <code>geosrs:CadastreMap</code> , <code>geosrs:NauticalChart</code> , <code>geosrs:ThematicMap</code> , <code>geosrs:TopographicMap</code> , <code>geosrs:WeatherMap</code> to be used in SPARQL graph patterns.

### 10.1.1. Class: `geosrs:CadastreMap`

Table 99 — `geosrs:CadastreMap`

URI	<a href="https://w3id.org/geosrs/application/CadastreMap">https://w3id.org/geosrs/application/CadastreMap</a>
Definition	A map displaying a cadastre.
Super-classes	<a href="#"><code>SRSApplication</code></a>
Example	<a href="#"><code>geosrs:CadastreMap</code></a>

### 10.1.2. Class: geosrs:NauticalChart

**Table 100** — geosrs:NauticalChart

URI	<a href="https://w3id.org/geosrs/application/NauticalChart">https://w3id.org/geosrs/application/NauticalChart</a>
Definition	A graphic representation of a sea area and adjacent coastal regions.
Super-classes	<a href="#">SRSAApplication</a>

### 10.1.3. Class: geosrs:ThematicMap

**Table 101** — geosrs:ThematicMap

URI	<a href="https://w3id.org/geosrs/application/ThematicMap">https://w3id.org/geosrs/application/ThematicMap</a>
Definition	A map used to highlight a specific phenomenon.
Super-classes	<a href="#">SRSAApplication</a>

### 10.1.4. Class: geosrs:TopographicMap

**Table 102** — geosrs:TopographicMap

URI	<a href="https://w3id.org/geosrs/application/TopographicMap">https://w3id.org/geosrs/application/TopographicMap</a>
Definition	A type of map characterized by large-scale detail and quantitative representation of relief.
Super-classes	<a href="#">SRSAApplication</a>
Example	<a href="#">geosrs:TopographicMap</a>

### 10.1.5. Class: geosrs:WeatherMap

**Table 103** — geosrs:WeatherMap

URI	<a href="https://w3id.org/geosrs/application/WeatherMap">https://w3id.org/geosrs/application/WeatherMap</a>
Definition	A map for showing the local direction in which weather systems are moving.
Super-classes	<a href="#">SRSApplication</a>

## 10.2. SRS Application Types

### REQUIREMENT 20: SRS APPLICATION TYPES

**IDENTIFIER** /req/srsapplication/SRS\_Application\_Types

**STATEMENT**

Implementations shall allow the RDFS classes geosrs:SRSApplication, geosrs:SpatialReferencing, geosrs:EngineeringSurvey, geosrs:SatelliteSurvey, geosrs:SatelliteNavigation, geosrs:Coastal Hydrography, geosrs:OffshoreEngineering, geosrs:Hydrography, geosrs:Drilling, geosrs:OilAndGas Exploration to be used in SPARQL graph patterns.

### 10.2.1. Class: geosrs:SRSApplication

**Table 104** — geosrs:SRSApplication

URI	<a href="https://w3id.org/geosrs/application/SRSApplication">https://w3id.org/geosrs/application/SRSApplication</a>
Definition	An application for which a spatial reference system is used.

### 10.2.2. Class: geosrs:SpatialReferencing

**Table 105** — geosrs:SpatialReferencing

URI	<a href="https://w3id.org/geosrs/application/SpatialReferencing">https://w3id.org/geosrs/application/SpatialReferencing</a>
Super-classes	<a href="#">SRSApplication</a>



### 10.2.3. Class: geosrs:EngineeringSurvey

**Table 106** — geosrs:EngineeringSurvey

URI	<a href="https://w3id.org/geosrs/application/EngineeringSurvey">https://w3id.org/geosrs/application/EngineeringSurvey</a>
Super-classes	<a href="#">SRSAApplication</a>
Example	<a href="#">geosrs:EngineeringSurvey</a>

### 10.2.4. Class: geosrs:SatelliteSurvey

**Table 107** — geosrs:SatelliteSurvey

URI	<a href="https://w3id.org/geosrs/application/SatelliteSurvey">https://w3id.org/geosrs/application/SatelliteSurvey</a>
Super-classes	<a href="#">SRSAApplication</a>

### 10.2.5. Class: geosrs:SatelliteNavigation

**Table 108** — geosrs:SatelliteNavigation

URI	<a href="https://w3id.org/geosrs/application/SatelliteNavigation">https://w3id.org/geosrs/application/SatelliteNavigation</a>
Super-classes	<a href="#">SRSAApplication</a>

### 10.2.6. Class: geosrs:CoastalHydrography

**Table 109** — geosrs:CoastalHydrography

URI	<a href="https://w3id.org/geosrs/application/CoastalHydrography">https://w3id.org/geosrs/application/CoastalHydrography</a>
Super-classes	<a href="#">SRSAApplication</a>
Example	<a href="#">geosrs:CoastalHydrography</a>

### 10.2.7. Class: geosrs:OffshoreEngineering

**Table 110** — geosrs:OffshoreEngineering

URI	<a href="https://w3id.org/geosrs/application/OffshoreEngineering">https://w3id.org/geosrs/application/OffshoreEngineering</a>
Super-classes	<a href="#">SRSAApplication</a>
Example	<code>geosrs:OffshoreEngineering</code>

### 10.2.8. Class: geosrs:Hydrography

**Table 111** — geosrs:Hydrography

URI	<a href="https://w3id.org/geosrs/application/Hydrography">https://w3id.org/geosrs/application/Hydrography</a>
Super-classes	<a href="#">SRSAApplication</a>
Example	<code>geosrs:Hydrography</code>

### 10.2.9. Class: geosrs:Drilling

**Table 112** — geosrs:Drilling

URI	<a href="https://w3id.org/geosrs/application/Drilling">https://w3id.org/geosrs/application/Drilling</a>
Super-classes	<a href="#">SRSAApplication</a>
Example	<code>geosrs:Drilling</code>

### 10.2.10. Class: geosrs:OilAndGasExploration

**Table 113** — geosrs:OilAndGasExploration

URI	<a href="https://w3id.org/geosrs/application/OilAndGasExploration">https://w3id.org/geosrs/application/OilAndGasExploration</a>
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11

# PROJECTIONS MODULE

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This clause establishes the **PROJ** Requirements class, with IRI /req/proj, which has a corresponding Conformance Class, **PROJ**, with IRI /conf/proj.

## REQUIREMENTS CLASS 6: 11-PROJECTIONS\_MODULE.ADOC EXTENSION

IDENTIFIER	/req/projections
TARGET TYPE	Implementation Specification
CONFORMANCE CLASS	Conformance class A.6: /conf/projections
REQUIREMENT	/req/projections/Lenticular_Projections
	/req/projections/Conformal_Projections
	/req/projections/Minimum_Error_Projections
	/req/projections/Pseudo_Azimuthal_Projections
	/req/projections/Equal_Area_Projections
	/req/projections/Pseudo_Conical_Projections
	/req/projections/Globular_Projections
	/req/projections/Pseudo_Cylindrical_Projections
	/req/projections/Archaic_Projections
	/req/projections/Cylindrical_Projections
	/req/projections/Compromise_Projections
	/req/projections/Polyhedral_Projections
	/req/projections/Equidistant_Projections
	/req/projections/Azimuthal_Projections
	/req/projections/Conical_Projections
	/req/projections/Perspective_Projections

## REQUIREMENTS CLASS 6: 11-PROJECTIONS\_MODULE.ADOC EXTENSION

/req/projections/Stereographic\_Projections

/req/projections/Polyconic\_Projections

/req/projections/Projection

### 11.1. Archaic Projections

#### REQUIREMENT 21: ARCHAIC PROJECTIONS

**IDENTIFIER** /req/projections/Archaic\_Projections

**STATEMENT** Implementations shall allow the RDFS classes geosrs:ArchaicProjection, geosrs:PtolemyProjection to be used in SPARQL graph patterns.

#### 11.1.1. Class: geosrs:ArchaicProjection

Table 114 — geosrs:ArchaicProjection

URI	<a href="https://w3id.org/geosrs/projection/ArchaicProjection">https://w3id.org/geosrs/projection/ArchaicProjection</a>
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#### 11.1.2. Class: geosrs:PtolemyProjection

Table 115 — geosrs:PtolemyProjection

URI	<a href="https://w3id.org/geosrs/projection/PtolemyProjection">https://w3id.org/geosrs/projection/PtolemyProjection</a>
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Super-classes	<a href="#">ArchaicProjection</a>
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### 11.2. Azimuthal Projections

## REQUIREMENT 22: AZIMUTHAL PROJECTIONS

**IDENTIFIER**     /req/projections/Azimuthal\_Projections

**STATEMENT**     Implementations shall allow the RDFS classes geosrs:AzimuthalProjection, geosrs:BreusingGeometricProjection, geosrs:BreusingHarmonicProjection, geosrs:GinzburgIIProjection, geosrs:GinzburgIProjection, geosrs:GnomonicProjection, geosrs:JamesAzimuthalProjection to be used in SPARQL graph patterns.

### 11.2.1. Class: geosrs:AzimuthalProjection

**Table 116** — geosrs:AzimuthalProjection

URI	<a href="https://w3id.org/geosrs/projection/AzimuthalProjection">https://w3id.org/geosrs/projection/AzimuthalProjection</a>
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### 11.2.2. Class: geosrs:BreusingGeometricProjection

**Table 117** — geosrs:BreusingGeometricProjection

URI	<a href="https://w3id.org/geosrs/projection/BreusingGeometricProjection">https://w3id.org/geosrs/projection/BreusingGeometricProjection</a>
Super-classes	<a href="#">AzimuthalProjection</a>

### 11.2.3. Class: geosrs:BreusingHarmonicProjection

**Table 118** — geosrs:BreusingHarmonicProjection

URI	<a href="https://w3id.org/geosrs/projection/BreusingHarmonicProjection">https://w3id.org/geosrs/projection/BreusingHarmonicProjection</a>
Super-classes	<a href="#">AzimuthalProjection</a>

### 11.2.4. Class: geosrs:GinzburgIIProjection

**Table 119** — geosrs:GinzburgIIProjection

URI	<a href="https://w3id.org/geosrs/projection/GinzburgIIProjection">https://w3id.org/geosrs/projection/GinzburgIIProjection</a>
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Super-classes

[AzimuthalProjection](#)

### 11.2.5. Class: geosrs:GinzburgIProjection

Table 120 — geosrs:GinzburgIProjection

URI	<a href="https://w3id.org/geosrs/projection/GinzburgIProjection">https://w3id.org/geosrs/projection/GinzburgIProjection</a>
Super-classes	<a href="#">AzimuthalProjection</a>

### 11.2.6. Class: geosrs:GnomonicProjection

Table 121 — geosrs:GnomonicProjection

URI	<a href="https://w3id.org/geosrs/projection/GnomonicProjection">https://w3id.org/geosrs/projection/GnomonicProjection</a>
Super-classes	<a href="#">AzimuthalProjection</a>

### 11.2.7. Class: geosrs:JamesAzimuthalProjection

Table 122 — geosrs:JamesAzimuthalProjection

URI	<a href="https://w3id.org/geosrs/projection/JamesAzimuthalProjection">https://w3id.org/geosrs/projection/JamesAzimuthalProjection</a>
Super-classes	<a href="#">AzimuthalProjection</a>

## 11.3. Compromise Projections

### REQUIREMENT 23: COMPROMISE PROJECTIONS

IDENTIFIER /req/projections/Compromise\_Projections

STATEMENT Implementations shall allow the RDFS classes geosrs:ArmadilloProjection, geosrs:BakerDinomic Projection, geosrs:BertinProjection, geosrs:ChamberlinTrimetricProjection, geosrs:DenoyerSemi EllipticalProjection, geosrs:FairgrieveProjection, geosrs:LarriveeProjection, geosrs:PetermannStar



## REQUIREMENT 23: COMPROMISE PROJECTIONS

Projection, geosrs:SpilhausOceanicProjection, geosrs:VanDerGrintenIIIProjection, geosrs:WinkelIIProjection, geosrs:WinkelIProjection, geosrs:WinkelSnyderProjection to be used in SPARQL graph patterns.

### 11.3.1. Class: geosrs:ArmadilloProjection

Table 123 — geosrs:ArmadilloProjection

URI	<a href="https://w3id.org/geosrs/projection/ArmadilloProjection">https://w3id.org/geosrs/projection/ArmadilloProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.3.2. Class: geosrs:BakerDinomicProjection

Table 124 — geosrs:BakerDinomicProjection

URI	<a href="https://w3id.org/geosrs/projection/BakerDinomicProjection">https://w3id.org/geosrs/projection/BakerDinomicProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.3.3. Class: geosrs:BertinProjection

Table 125 — geosrs:BertinProjection

URI	<a href="https://w3id.org/geosrs/projection/BertinProjection">https://w3id.org/geosrs/projection/BertinProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.3.4. Class: geosrs:ChamberlinTrimetricProjection

Table 126 — geosrs:ChamberlinTrimetricProjection

URI	<a href="https://w3id.org/geosrs/projection/ChamberlinTrimetricProjection">https://w3id.org/geosrs/projection/ChamberlinTrimetricProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.3.5. Class: geosrs:DenoyerSemiEllipticalProjection

Table 127 — geosrs:DenoyerSemiEllipticalProjection

URI	<a href="https://w3id.org/geosrs/projection/DenoyerSemiEllipticalProjection">https://w3id.org/geosrs/projection/DenoyerSemiEllipticalProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.3.6. Class: geosrs:FairgrieveProjection

Table 128 — geosrs:FairgrieveProjection

URI	<a href="https://w3id.org/geosrs/projection/FairgrieveProjection">https://w3id.org/geosrs/projection/FairgrieveProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.3.7. Class: geosrs:LarriveeProjection

Table 129 — geosrs:LarriveeProjection

URI	<a href="https://w3id.org/geosrs/projection/LarriveeProjection">https://w3id.org/geosrs/projection/LarriveeProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.3.8. Class: geosrs:PetermannStarProjection

Table 130 — geosrs:PetermannStarProjection

URI	<a href="https://w3id.org/geosrs/projection/PetermannStarProjection">https://w3id.org/geosrs/projection/PetermannStarProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.3.9. Class: geosrs:SpilhausOceanicProjection

**Table 131** — geosrs:SpilhausOceanicProjection

URI	<a href="https://w3id.org/geosrs/projection/SpilhausOceanicProjection">https://w3id.org/geosrs/projection/SpilhausOceanicProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.3.10. Class: geosrs:VanDerGrintenIIIProjection

**Table 132** — geosrs:VanDerGrintenIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/VanDerGrintenIIIProjection">https://w3id.org/geosrs/projection/VanDerGrintenIIIProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.3.11. Class: geosrs:WinkelIIIProjection

**Table 133** — geosrs:WinkelIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/WinkelIIIProjection">https://w3id.org/geosrs/projection/WinkelIIIProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.3.12. Class: geosrs:WinkelIIProjection

**Table 134** — geosrs:WinkelIIProjection

URI	<a href="https://w3id.org/geosrs/projection/WinkelIIProjection">https://w3id.org/geosrs/projection/WinkelIIProjection</a>
Super-classes	<a href="#">CompromiseProjection</a>

### 11.3.13. Class: geosrs:WinkelSnyderProjection

**Table 135** — geosrs:WinkelSnyderProjection

URI	<a href="https://w3id.org/geosrs/projection/WinkelSnyderProjection">https://w3id.org/geosrs/projection/WinkelSnyderProjection</a>
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## 11.4. Conformal Projections

### REQUIREMENT 24: CONFORMAL PROJECTIONS

**IDENTIFIER** /req/projections/Conformal\_Projections

**STATEMENT** Implementations shall allow the RDFS classes geosrs:AdamsProjection, geosrs:AdamsWorldInASquarellProjection, geosrs:AdamsWorldInASquarelProjection, geosrs:AugustEpicycloidalProjection, geosrs:CoxConformalProjection, geosrs:EisenlohrProjection, geosrs:GS50Projection, geosrs:PeirceQuincuncialProjection, geosrs:StereographicProjection to be used in SPARQL graph patterns.

### 11.4.1. Class: geosrs:AdamsProjection

**Table 136** — geosrs:AdamsProjection

URI	<a href="https://w3id.org/geosrs/projection/AdamsProjection">https://w3id.org/geosrs/projection/AdamsProjection</a>
Super-classes	<a href="#">ConformalProjection</a>

### 11.4.2. Class: geosrs:AdamsWorldInASquarellProjection

**Table 137** — geosrs:AdamsWorldInASquarellProjection

URI	<a href="https://w3id.org/geosrs/projection/AdamsWorldInASquarellProjection">https://w3id.org/geosrs/projection/AdamsWorldInASquarellProjection</a>
Super-classes	<a href="#">ConformalProjection</a>

### 11.4.3. Class: geosrs:AdamsWorldInASquarelProjection

**Table 138** — geosrs:AdamsWorldInASquareProjection

URI	<a href="https://w3id.org/geosrs/projection/AdamsWorldInASquareProjection">https://w3id.org/geosrs/projection/AdamsWorldInASquareProjection</a>
Super-classes	<a href="#">ConformalProjection</a>

#### 11.4.4. Class: geosrs:AugustEpicycloidalProjection

**Table 139** — geosrs:AugustEpicycloidalProjection

URI	<a href="https://w3id.org/geosrs/projection/AugustEpicycloidalProjection">https://w3id.org/geosrs/projection/AugustEpicycloidalProjection</a>
Definition	A projection in which every angle between two curves that cross each other on a celestial body is preserved in the image of the projection
Super-classes	<a href="#">ConformalProjection</a>

#### 11.4.5. Class: geosrs:CoxConformalProjection

**Table 140** — geosrs:CoxConformalProjection

URI	<a href="https://w3id.org/geosrs/projection/CoxConformalProjection">https://w3id.org/geosrs/projection/CoxConformalProjection</a>
Super-classes	<a href="#">ConformalProjection</a>

#### 11.4.6. Class: geosrs:EisenlohrProjection

**Table 141** — geosrs:EisenlohrProjection

URI	<a href="https://w3id.org/geosrs/projection/EisenlohrProjection">https://w3id.org/geosrs/projection/EisenlohrProjection</a>
Super-classes	<a href="#">ConformalProjection</a>

#### 11.4.7. Class: geosrs:GS50Projection

**Table 142** — geosrs:GS50Projection

URI	<a href="https://w3id.org/geosrs/projection/GS50Projection">https://w3id.org/geosrs/projection/GS50Projection</a>
Super-classes	<a href="#">ConformalProjection</a>

### 11.4.8. Class: geosrs:PeirceQuincuncialProjection

**Table 143** — geosrs:PeirceQuincuncialProjection

URI	<a href="https://w3id.org/geosrs/projection/PeirceQuincuncialProjection">https://w3id.org/geosrs/projection/PeirceQuincuncialProjection</a>
Super-classes	<a href="#">ConformalProjection</a>

### 11.4.9. Class: geosrs:StereographicProjection

**Table 144** — geosrs:StereographicProjection

URI	<a href="https://w3id.org/geosrs/projection/StereographicProjection">https://w3id.org/geosrs/projection/StereographicProjection</a>
Super-classes	<a href="#">ConformalProjection</a>
Example	<a href="#">geosrs:StereographicProjection</a>

## 11.5. Conical Projections

REQUIREMENT 25: CONICAL PROJECTIONS	
IDENTIFIER	/req/projections/Conical_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:BipolarObliqueConicConformalProjection, geosrs:CentralConicProjection, geosrs:HerschelConformalConicProjection, geosrs:Krovak, geosrs:LambertConformalConicProjection, geosrs:MurdochIIIProjection, geosrs:MurdochIIProjection, geosrs:MurdochIProjection, geosrs:SchjernerIProjection, geosrs:VitkovskyIProjection to be used in SPARQL graph patterns.

### 11.5.1. Class: geosrs:BipolarObliqueConicConformalProjection

**Table 145** — geosrs:BipolarObliqueConicConformalProjection

URI	<a href="https://w3id.org/geosrs/projection/BipolarObliqueConicConformalProjection">https://w3id.org/geosrs/projection/BipolarObliqueConicConformalProjection</a>
Super-classes	<a href="#">ConicalProjection</a>

### 11.5.2. Class: geosrs:CentralConicProjection

**Table 146** — geosrs:CentralConicProjection

URI	<a href="https://w3id.org/geosrs/projection/CentralConicProjection">https://w3id.org/geosrs/projection/CentralConicProjection</a>
Super-classes	<a href="#">ConicalProjection</a>

### 11.5.3. Class: geosrs:HerschelConformalConicProjection

**Table 147** — geosrs:HerschelConformalConicProjection

URI	<a href="https://w3id.org/geosrs/projection/HerschelConformalConicProjection">https://w3id.org/geosrs/projection/HerschelConformalConicProjection</a>
Super-classes	<a href="#">ConicalProjection</a>

### 11.5.4. Class: geosrs:Krovak

**Table 148** — geosrs:Krovak

URI	<a href="https://w3id.org/geosrs/projection/Krovak">https://w3id.org/geosrs/projection/Krovak</a>
Super-classes	<a href="#">ConicalProjection</a>
Example	<a href="#">geosrs:Krovak</a>

### 11.5.5. Class: geosrs:LambertConformalConicProjection

**Table 149** — geosrs:LambertConformalConicProjection

URI	<a href="https://w3id.org/geosrs/projection/LambertConformalConicProjection">https://w3id.org/geosrs/projection/LambertConformalConicProjection</a>
Super-classes	<a href="#">ConicalProjection</a>

### 11.5.6. Class: geosrs:MurdochIIIProjection

**Table 150** — geosrs:MurdochIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/MurdochIIIProjection">https://w3id.org/geosrs/projection/MurdochIIIProjection</a>
Super-classes	<a href="#">ConicalProjection</a>

### 11.5.7. Class: geosrs:MurdochIIProjection

**Table 151** — geosrs:MurdochIIProjection

URI	<a href="https://w3id.org/geosrs/projection/MurdochIIProjection">https://w3id.org/geosrs/projection/MurdochIIProjection</a>
Super-classes	<a href="#">ConicalProjection</a>

### 11.5.8. Class: geosrs:MurdochIProjection

**Table 152** — geosrs:MurdochIProjection

URI	<a href="https://w3id.org/geosrs/projection/MurdochIProjection">https://w3id.org/geosrs/projection/MurdochIProjection</a>
Super-classes	<a href="#">ConicalProjection</a>

### 11.5.9. Class: geosrs:SchjernerIProjection



**Table 153** — geosrs:SchjernerIProjection

URI	<a href="https://w3id.org/geosrs/projection/SchjernerIProjection">https://w3id.org/geosrs/projection/SchjernerIProjection</a>
Super-classes	<a href="#">ConicalProjection</a>

### 11.5.10. Class: geosrs:VitkovskylProjection

**Table 154** — geosrs:VitkovskylProjection

URI	<a href="https://w3id.org/geosrs/projection/VitkovskylProjection">https://w3id.org/geosrs/projection/VitkovskylProjection</a>
Super-classes	<a href="#">ConicalProjection</a>

## 11.6. Cylindrical Projections

### REQUIREMENT 26: CYLINDRICAL PROJECTIONS

**IDENTIFIER**    /req/projections/Cylindrical\_Projections

**STATEMENT**

Implementations shall allow the RDFS classes geosrs:ArdenCloseProjection, geosrs:BSAMCylindricalProjection, geosrs:BalthasartProjection, geosrs:BehrmannProjection, geosrs:BraunPerspectiveProjection, geosrs:BraunStereographicProjection, geosrs:CompactMillerProjection, geosrs:CylindricalProjection, geosrs:CylindricalStereographicProjection, geosrs:KarchenkoShabanovaProjection, geosrs:LabordeProjection, geosrs:MercatorProjection, geosrs:MillerProjection, geosrs:PattersonCylindricalProjection, geosrs:PavlovProjection, geosrs:ToblerCylindricalIIProjection, geosrs:ToblerCylindricalIProjection, geosrs:TransverseMercatorProjection, geosrs:UrmayevIIProjection, geosrs:WebMercatorProjection to be used in SPARQL graph patterns.

### 11.6.1. Class: geosrs:ArdenCloseProjection

**Table 155** — geosrs:ArdenCloseProjection

URI	<a href="https://w3id.org/geosrs/projection/ArdenCloseProjection">https://w3id.org/geosrs/projection/ArdenCloseProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

### 11.6.2. Class: geosrs:BSAMCylindricalProjection

Table 156 — geosrs:BSAMCylindricalProjection

URI	<a href="https://w3id.org/geosrs/projection/BSAMCylindricalProjection">https://w3id.org/geosrs/projection/BSAMCylindricalProjection</a>
Super-classes	<a href="#">CylindricalStereographicProjection</a>

### 11.6.3. Class: geosrs:BalthasartProjection

Table 157 — geosrs:BalthasartProjection

URI	<a href="https://w3id.org/geosrs/projection/BalthasartProjection">https://w3id.org/geosrs/projection/BalthasartProjection</a>
Definition	A cylindrical equal-area projection that uses a standard parallel of $\phi_s=50$ degrees
Super-classes	<a href="#">CylindricalEqualArea</a>

### 11.6.4. Class: geosrs:BehrmannProjection

Table 158 — geosrs:BehrmannProjection

URI	<a href="https://w3id.org/geosrs/projection/BehrmannProjection">https://w3id.org/geosrs/projection/BehrmannProjection</a>
Definition	A cylindrical equal-area map projection with standard parallels set at 30° north and south
Super-classes	<a href="#">CylindricalEqualArea</a>

### 11.6.5. Class: geosrs:BraunPerspectiveProjection

Table 159 — geosrs:BraunPerspectiveProjection

URI	<a href="https://w3id.org/geosrs/projection/BraunPerspectiveProjection">https://w3id.org/geosrs/projection/BraunPerspectiveProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

### 11.6.6. Class: geosrs:BraunStereographicProjection

Table 160 — geosrs:BraunStereographicProjection

URI	<a href="https://w3id.org/geosrs/projection/BraunStereographicProjection">https://w3id.org/geosrs/projection/BraunStereographicProjection</a>
Super-classes	<a href="#">CylindricalStereographicProjection</a>

### 11.6.7. Class: geosrs:CompactMillerProjection

Table 161 — geosrs:CompactMillerProjection

URI	<a href="https://w3id.org/geosrs/projection/CompactMillerProjection">https://w3id.org/geosrs/projection/CompactMillerProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

### 11.6.8. Class: geosrs:CylindricalProjection

Table 162 — geosrs:CylindricalProjection

URI	<a href="https://w3id.org/geosrs/projection/CylindricalProjection">https://w3id.org/geosrs/projection/CylindricalProjection</a>
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### 11.6.9. Class: geosrs:CylindricalStereographicProjection

Table 163 — geosrs:CylindricalStereographicProjection

URI	<a href="https://w3id.org/geosrs/projection/CylindricalStereographicProjection">https://w3id.org/geosrs/projection/CylindricalStereographicProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

### 11.6.10. Class: geosrs:KarchenkoShabanovaProjection

**Table 164** — geosrs:KarchenkoShabanovaProjection

URI	<a href="https://w3id.org/geosrs/projection/KarchenkoShabanovaProjection">https://w3id.org/geosrs/projection/KarchenkoShabanovaProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

### 11.6.11. Class: geosrs:LabordeProjection

**Table 165** — geosrs:LabordeProjection

URI	<a href="https://w3id.org/geosrs/projection/LabordeProjection">https://w3id.org/geosrs/projection/LabordeProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>
Example	<a href="#">geosrs:LabordeProjection</a>

### 11.6.12. Class: geosrs:MercatorProjection

**Table 166** — geosrs:MercatorProjection

URI	<a href="https://w3id.org/geosrs/projection/MercatorProjection">https://w3id.org/geosrs/projection/MercatorProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>
Example	<a href="#">geosrs:MercatorProjection</a>

### 11.6.13. Class: geosrs:MillerProjection

**Table 167** — geosrs:MillerProjection

URI	<a href="https://w3id.org/geosrs/projection/MillerProjection">https://w3id.org/geosrs/projection/MillerProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

### 11.6.14. Class: geosrs:PattersonCylindricalProjection

**Table 168** — geosrs:PattersonCylindricalProjection

URI	<a href="https://w3id.org/geosrs/projection/PattersonCylindricalProjection">https://w3id.org/geosrs/projection/PattersonCylindricalProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

### 11.6.15. Class: geosrs:PavlovProjection

**Table 169** — geosrs:PavlovProjection

URI	<a href="https://w3id.org/geosrs/projection/PavlovProjection">https://w3id.org/geosrs/projection/PavlovProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

### 11.6.16. Class: geosrs:ToblerCylindricalIIIProjection

**Table 170** — geosrs:ToblerCylindricalIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/ToblerCylindricalIIIProjection">https://w3id.org/geosrs/projection/ToblerCylindricalIIIProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

### 11.6.17. Class: geosrs:ToblerCylindricalIIProjection

**Table 171** — geosrs:ToblerCylindricalIIProjection

URI	<a href="https://w3id.org/geosrs/projection/ToblerCylindricalIIProjection">https://w3id.org/geosrs/projection/ToblerCylindricalIIProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

### 11.6.18. Class: geosrs:TransverseMercatorProjection

**Table 172** — geosrs:TransverseMercatorProjection

URI	<a href="https://w3id.org/geosrs/projection/TransverseMercatorProjection">https://w3id.org/geosrs/projection/TransverseMercatorProjection</a>
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Super-classes	<a href="#">MercatorProjection</a>
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### 11.6.19. Class: geosrs:UrmayevIIIProjection

Table 173 — geosrs:UrmayevIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/UrmayevIIIProjection">https://w3id.org/geosrs/projection/UrmayevIIIProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

### 11.6.20. Class: geosrs:WebMercatorProjection

Table 174 — geosrs:WebMercatorProjection

URI	<a href="https://w3id.org/geosrs/projection/WebMercatorProjection">https://w3id.org/geosrs/projection/WebMercatorProjection</a>
Super-classes	<a href="#">CylindricalProjection</a>

## 11.7. Equal Area Projections

### REQUIREMENT 27: EQUAL AREA PROJECTIONS

**IDENTIFIER** /req/projections/Equal\_Area\_Projections

**STATEMENT** Implementations shall allow the RDFS classes geosrs:AlbersEqualAreaProjection, geosrs:AzimuthalEqualAreaProjection, geosrs:CylindricalEqualArea, geosrs:EqualAreaProjection, geosrs:GallPetersProjection, geosrs:HoboDyerProjection, geosrs:LambertAzimuthalEqualArea, geosrs:LambertCylindricalEqualAreaProjection, geosrs:ObliqueCylindricalEqualAreaProjection, geosrs:SlideAndDiceParallelSmallCircle, geosrs:SliceAndDiceVertexGreatCircle, geosrs:SmythEqualSurfaceProjection, geosrs:SnyderEqualArea, geosrs:ToblerWorldInASquareProjection, geosrs:TransverseCylindricalEqualAreaProjection, geosrs:TrystanEdwardsProjection, geosrs:WiechelProjection to be used in SPARQL graph patterns.

#### 11.7.1. Class: geosrs:AlbersEqualAreaProjection

**Table 175** — geosrs:AlbersEqualAreaProjection

URI	<a href="https://w3id.org/geosrs/projection/AlbersEqualAreaProjection">https://w3id.org/geosrs/projection/AlbersEqualAreaProjection</a>
Super-classes	<a href="#">EqualAreaProjection</a>
Example	<a href="#">geosrs:AlbersEqualAreaProjection</a>

### 11.7.2. Class: geosrs:AzimuthalEqualAreaProjection

**Table 176** — geosrs:AzimuthalEqualAreaProjection

URI	<a href="https://w3id.org/geosrs/projection/AzimuthalEqualAreaProjection">https://w3id.org/geosrs/projection/AzimuthalEqualAreaProjection</a>
Super-classes	<a href="#">EqualAreaProjection</a>

### 11.7.3. Class: geosrs:CylindricalEqualArea

**Table 177** — geosrs:CylindricalEqualArea

URI	<a href="https://w3id.org/geosrs/projection/CylindricalEqualArea">https://w3id.org/geosrs/projection/CylindricalEqualArea</a>
Super-classes	<a href="#">EqualAreaProjection</a>
Example	<a href="#">geosrs:CylindricalEqualArea</a>

### 11.7.4. Class: geosrs:EqualAreaProjection

**Table 178** — geosrs:EqualAreaProjection

URI	<a href="https://w3id.org/geosrs/projection/EqualAreaProjection">https://w3id.org/geosrs/projection/EqualAreaProjection</a>
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### 11.7.5. Class: geosrs:GallPetersProjection

**Table 179** — geosrs:GallPetersProjection

URI	<a href="https://w3id.org/geosrs/projection/GallPetersProjection">https://w3id.org/geosrs/projection/GallPetersProjection</a>
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Super-classes

[EqualAreaProjection](#)

### 11.7.6. Class: geosrs:HoboDyerProjection

**Table 180** — geosrs:HoboDyerProjection

URI

<https://w3id.org/geosrs/projection/HoboDyerProjection>

Super-classes

[EqualAreaProjection](#)

### 11.7.7. Class: geosrs:LambertAzimuthalEqualArea

**Table 181** — geosrs:LambertAzimuthalEqualArea

URI

<https://w3id.org/geosrs/projection/LambertAzimuthalEqualArea>

Super-classes

[EqualAreaProjection](#)

### 11.7.8. Class: geosrs:LambertCylindricalEqualAreaProjection

**Table 182** — geosrs:LambertCylindricalEqualAreaProjection

URI

<https://w3id.org/geosrs/projection/LambertCylindricalEqualAreaProjection>

Super-classes

[CylindricalEqualArea](#)

### 11.7.9. Class: geosrs:ObliqueCylindricalEqualAreaProjection

**Table 183** — geosrs:ObliqueCylindricalEqualAreaProjection

URI

<https://w3id.org/geosrs/projection/ObliqueCylindricalEqualAreaProjection>

Super-classes

[CylindricalEqualArea](#)



## 11.7.10. Class: geosrs:SlideAndDiceParallelSmallCircle

**Table 184** — geosrs:SlideAndDiceParallelSmallCircle

URI	<a href="https://w3id.org/geosrs/projection/SlideAndDiceParallelSmallCircle">https://w3id.org/geosrs/projection/SlideAndDiceParallelSmallCircle</a>
Definition	The Parallel Small Circle version of the equa-area projection method defined for polyhedral globes by van Leeuwen and Strebe. van Leeuwen, D., & Strebe, D. (2006). A “Slice-and-Dice” Approach to Area Equivalence in Polyhedral Map Projections. Cartography and Geographic Information Science, 33(4), 269–286.
Super-classes	<a href="#">EqualAreaProjection</a>

## 11.7.11. Class: geosrs:SliceAndDiceVertexGreatCircle

**Table 185** — geosrs:SliceAndDiceVertexGreatCircle

URI	<a href="https://w3id.org/geosrs/projection/SliceAndDiceVertexGreatCircle">https://w3id.org/geosrs/projection/SliceAndDiceVertexGreatCircle</a>
Definition	The Vertex-oriented Great Circle version of the equa-area projection method defined for polyhedral globes by van Leeuwen and Strebe. van Leeuwen, D., & Strebe, D. (2006). A “Slice-and-Dice” Approach to Area Equivalence in Polyhedral Map Projections. Cartography and Geographic Information Science, 33(4), 269–286.
Super-classes	<a href="#">EqualAreaProjection</a>

## 11.7.12. Class: geosrs:SmythEqualSurfaceProjection

**Table 186** — geosrs:SmythEqualSurfaceProjection

URI	<a href="https://w3id.org/geosrs/projection/SmythEqualSurfaceProjection">https://w3id.org/geosrs/projection/SmythEqualSurfaceProjection</a>
Super-classes	<a href="#">CylindricalEqualArea</a>

### 11.7.13. Class: geosrs:SnyderEqualArea

**Table 187** — geosrs:SnyderEqualArea

URI	<a href="https://w3id.org/geosrs/projection/SnyderEqualArea">https://w3id.org/geosrs/projection/SnyderEqualArea</a>
Definition	Equal area projection for polyhedral globes, used frequently in Discrete Global Grid Systems. Snyder, J.P. (1992). "An Equal-Area Map Projection for Polyhedral Globes". Cartographica. 29 (1): 10–21
Super-classes	<a href="#">EqualAreaProjection</a>

### 11.7.14. Class: geosrs:ToblerWorldInASquareProjection

**Table 188** — geosrs:ToblerWorldInASquareProjection

URI	<a href="https://w3id.org/geosrs/projection/ToblerWorldInASquareProjection">https://w3id.org/geosrs/projection/ToblerWorldInASquareProjection</a>
Super-classes	<a href="#">CylindricalEqualArea</a>

### 11.7.15. Class: geosrs:TransverseCylindricalEqualAreaProjection

**Table 189** — geosrs:TransverseCylindricalEqualAreaProjection

URI	<a href="https://w3id.org/geosrs/projection/TransverseCylindricalEqualAreaProjection">https://w3id.org/geosrs/projection/TransverseCylindricalEqualAreaProjection</a>
Super-classes	<a href="#">CylindricalEqualArea</a>

### 11.7.16. Class: geosrs:TrystanEdwardsProjection

**Table 190** — geosrs:TrystanEdwardsProjection

URI	<a href="https://w3id.org/geosrs/projection/TrystanEdwardsProjection">https://w3id.org/geosrs/projection/TrystanEdwardsProjection</a>
Super-classes	<a href="#">EqualAreaProjection</a>

### 11.7.17. Class: geosrs:WiechelProjection

Table 191 – geosrs:WiechelProjection

URI	<a href="https://w3id.org/geosrs/projection/WichelProjection">https://w3id.org/geosrs/projection/WichelProjection</a>
Super-classes	<a href="#">EqualAreaProjection</a>

## 11.8. Equidistant Projections

### REQUIREMENT 28: EQUIDISTANT PROJECTIONS

**IDENTIFIER** /req/projections/Equidistant\_Projections

**STATEMENT** Implementations shall allow the RDFS classes geosrs:AzimuthalEquidistantProjection, geosrs:BerghausStarProjection, geosrs:CassiniProjection, geosrs:EquidistantConicProjection, geosrs:EquidistantCylindricalProjection, geosrs:EquidistantProjection, geosrs:EquiarectangularProjection, geosrs:ObliquePlateCarreeProjection, geosrs:PlateCarreeProjection, geosrs:TwoPointEquidistantProjection to be used in SPARQL graph patterns.

### 11.8.1. Class: geosrs:AzimuthalEquidistantProjection

Table 192 – geosrs:AzimuthalEquidistantProjection

URI	<a href="https://w3id.org/geosrs/projection/AzimuthalEquidistantProjection">https://w3id.org/geosrs/projection/AzimuthalEquidistantProjection</a>
Super-classes	<a href="#">EquidistantProjection</a>
Example	<a href="#">geosrs:AzimuthalEquidistantProjection</a>

### 11.8.2. Class: geosrs:BerghausStarProjection

**Table 193** — geosrs:BerghausStarProjection

URI	<a href="https://w3id.org/geosrs/projection/BerghausStarProjection">https://w3id.org/geosrs/projection/BerghausStarProjection</a>
Super-classes	<a href="#">EquidistantProjection</a>

### 11.8.3. Class: geosrs:CassiniProjection

**Table 194** — geosrs:CassiniProjection

URI	<a href="https://w3id.org/geosrs/projection/CassiniProjection">https://w3id.org/geosrs/projection/CassiniProjection</a>
Definition	A map projection first described in an approximate form by César-François Cassini de Thury in 1745
Super-classes	<a href="#">EquidistantProjection</a>
Example	<a href="#">geosrs:CassiniProjection</a>

### 11.8.4. Class: geosrs:EquidistantConicProjection

**Table 195** — geosrs:EquidistantConicProjection

URI	<a href="https://w3id.org/geosrs/projection/EquidistantConicProjection">https://w3id.org/geosrs/projection/EquidistantConicProjection</a>
Super-classes	<a href="#">EquidistantProjection</a>

### 11.8.5. Class: geosrs:EquidistantCylindricalProjection

**Table 196** — geosrs:EquidistantCylindricalProjection

URI	<a href="https://w3id.org/geosrs/projection/EquidistantCylindricalProjection">https://w3id.org/geosrs/projection/EquidistantCylindricalProjection</a>
Super-classes	<a href="#">EquidistantProjection</a>
Example	<a href="#">geosrs:EquidistantCylindricalProjection</a>

### 11.8.6. Class: geosrs:EquidistantProjection

Table 197 — geosrs:EquidistantProjection

URI	<a href="https://w3id.org/geosrs/projection/EquidistantProjection">https://w3id.org/geosrs/projection/EquidistantProjection</a>
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### 11.8.7. Class: geosrs:EquirectangularProjection

Table 198 — geosrs:EquirectangularProjection

URI	<a href="https://w3id.org/geosrs/projection/EquirectangularProjection">https://w3id.org/geosrs/projection/EquirectangularProjection</a>
Super-classes	<a href="#">EquidistantProjection</a>

### 11.8.8. Class: geosrs:ObliquePlateCarreeProjection

Table 199 — geosrs:ObliquePlateCarreeProjection

URI	<a href="https://w3id.org/geosrs/projection/ObliquePlateCarreeProjection">https://w3id.org/geosrs/projection/ObliquePlateCarreeProjection</a>
Super-classes	<a href="#">EquidistantProjection</a>

### 11.8.9. Class: geosrs:PlateCarreeProjection

Table 200 — geosrs:PlateCarreeProjection

URI	<a href="https://w3id.org/geosrs/projection/PlateCarreeProjection">https://w3id.org/geosrs/projection/PlateCarreeProjection</a>
Super-classes	<a href="#">EquidistantProjection</a>

### 11.8.10. Class: geosrs:TwoPointEquidistantProjection

**Table 201** — geosrs:TwoPointEquidistantProjection

URI	<a href="https://w3id.org/geosrs/projection/TwoPointEquidistantProjection">https://w3id.org/geosrs/projection/TwoPointEquidistantProjection</a>
Super-classes	<a href="#">EquidistantProjection</a>

## 11.9. Globular Projections

### REQUIREMENT 29: GLOBULAR PROJECTIONS

IDENTIFIER	/req/projections/Globular_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:ApianGlobularIProjection, geosrs:BaconGlobularProjection, geosrs:FournierGlobularIProjection to be used in SPARQL graph patterns.

#### 11.9.1. Class: geosrs:ApianGlobularIProjection

**Table 202** — geosrs:ApianGlobularIProjection

URI	<a href="https://w3id.org/geosrs/projection/ApianGlobularIProjection">https://w3id.org/geosrs/projection/ApianGlobularIProjection</a>
Super-classes	<a href="#">GlobularProjection</a>

#### 11.9.2. Class: geosrs:BaconGlobularProjection

**Table 203** — geosrs:BaconGlobularProjection

URI	<a href="https://w3id.org/geosrs/projection/BaconGlobularProjection">https://w3id.org/geosrs/projection/BaconGlobularProjection</a>
Super-classes	<a href="#">GlobularProjection</a>

#### 11.9.3. Class: geosrs:FournierGlobularIProjection

**Table 204** — geosrs:FournierGlobularIProjection

URI	<a href="https://w3id.org/geosrs/projection/FournierGlobularIProjection">https://w3id.org/geosrs/projection/FournierGlobularIProjection</a>
Super-classes	<a href="#">GlobularProjection</a>

## 11.10. Lenticular Projections

### REQUIREMENT 30: LENTICULAR PROJECTIONS

IDENTIFIER	/req/projections/Lenticular_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:A4Projection, geosrs:BriesemeisterProjection, geosrs:CiricIProjection, geosrs:CupolaProjection, geosrs:DedistortProjection, geosrs:DietrichKitadaProjection, geosrs:FranculaIIProjection, geosrs:FranculaIVProjection, geosrs:FranculaIXProjection, geosrs:FranculaVIIIProjection, geosrs:FranculaVProjection, geosrs:FranculaXIIIProjection, geosrs:FranculaXIIProjection, geosrs:FranculaXIVProjection, geosrs:HamusoidalProjection, geosrs:KissProjection to be used in SPARQL graph patterns.

### 11.10.1. Class: geosrs:A4Projection

**Table 205** — geosrs:A4Projection

URI	<a href="https://w3id.org/geosrs/projection/A4Projection">https://w3id.org/geosrs/projection/A4Projection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.10.2. Class: geosrs:BriesemeisterProjection

**Table 206** — geosrs:BriesemeisterProjection

URI	<a href="https://w3id.org/geosrs/projection/BriesemeisterProjection">https://w3id.org/geosrs/projection/BriesemeisterProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.10.3. Class: geosrs:CiricIProjection

Table 207 — geosrs:CiricIProjection

URI	<a href="https://w3id.org/geosrs/projection/CiricIProjection">https://w3id.org/geosrs/projection/CiricIProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.10.4. Class: geosrs:CupolaProjection

Table 208 — geosrs:CupolaProjection

URI	<a href="https://w3id.org/geosrs/projection/CupolaProjection">https://w3id.org/geosrs/projection/CupolaProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.10.5. Class: geosrs:DedistortProjection

Table 209 — geosrs:DedistortProjection

URI	<a href="https://w3id.org/geosrs/projection/DedistortProjection">https://w3id.org/geosrs/projection/DedistortProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.10.6. Class: geosrs:DietrichKitadaProjection

Table 210 — geosrs:DietrichKitadaProjection

URI	<a href="https://w3id.org/geosrs/projection/DietrichKitadaProjection">https://w3id.org/geosrs/projection/DietrichKitadaProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.10.7. Class: geosrs:FranculallIProjection



**Table 211** — geosrs:FranculaIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/FranculaIIIProjection">https://w3id.org/geosrs/projection/FranculaIIIProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.10.8. Class: geosrs:FranculaIVProjection

**Table 212** — geosrs:FranculaIVProjection

URI	<a href="https://w3id.org/geosrs/projection/FranculaIVProjection">https://w3id.org/geosrs/projection/FranculaIVProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.10.9. Class: geosrs:FranculaIXProjection

**Table 213** — geosrs:FranculaIXProjection

URI	<a href="https://w3id.org/geosrs/projection/FranculaIXProjection">https://w3id.org/geosrs/projection/FranculaIXProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.10.10. Class: geosrs:FranculaVIIIProjection

**Table 214** — geosrs:FranculaVIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/FranculaVIIIProjection">https://w3id.org/geosrs/projection/FranculaVIIIProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.10.11. Class: geosrs:FranculaVProjection

**Table 215** — geosrs:FranculaVProjection

URI	<a href="https://w3id.org/geosrs/projection/FranculaVProjection">https://w3id.org/geosrs/projection/FranculaVProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.10.12. Class: geosrs:FraculaXIIIProjection

Table 216 — geosrs:FraculaXIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/FraculaXIIIProjection">https://w3id.org/geosrs/projection/FraculaXIIIProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.10.13. Class: geosrs:FraculaXIIProjection

Table 217 — geosrs:FraculaXIIProjection

URI	<a href="https://w3id.org/geosrs/projection/FraculaXIIProjection">https://w3id.org/geosrs/projection/FraculaXIIProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.10.14. Class: geosrs:FraculaXIVProjection

Table 218 — geosrs:FraculaXIVProjection

URI	<a href="https://w3id.org/geosrs/projection/FraculaXIVProjection">https://w3id.org/geosrs/projection/FraculaXIVProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.10.15. Class: geosrs:HamusoidalProjection

Table 219 — geosrs:HamusoidalProjection

URI	<a href="https://w3id.org/geosrs/projection/HamusoidalProjection">https://w3id.org/geosrs/projection/HamusoidalProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

### 11.10.16. Class: geosrs:KissProjection

**Table 220** — geosrs:KissProjection

URI	<a href="https://w3id.org/geosrs/projection/KissProjection">https://w3id.org/geosrs/projection/KissProjection</a>
Super-classes	<a href="#">LenticularProjection</a>

## 11.11. Minimum Error Projections

### REQUIREMENT 31: MINIMUM ERROR PROJECTIONS

IDENTIFIER	/req/projections/Minimum_Error_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:AiryProjection to be used in SPARQL graph patterns.

#### 11.11.1. Class: geosrs:AiryProjection

**Table 221** — geosrs:AiryProjection

URI	<a href="https://w3id.org/geosrs/projection/AiryProjection">https://w3id.org/geosrs/projection/AiryProjection</a>
Definition	An azimuthal minimum error projection for the region within the small or great circle defined by an angular distance, from the tangency point of the plane
Super-classes	<a href="#">MinimumErrorProjection</a>
Example	<a href="#">geosrs:AiryProjection</a>

## 11.12. Perspective Projections

### REQUIREMENT 32: PERSPECTIVE PROJECTIONS

IDENTIFIER	/req/projections/Perspective_Projections
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## REQUIREMENT 32: PERSPECTIVE PROJECTIONS

STATEMENT	Implementations shall allow the RDFS classes <code>geosrs:CentralCylindricalProjection</code> , <code>geosrs:GeneralVerticalPerspectiveProjection</code> , <code>geosrs:GilbertTwoWorldPerspectiveProjection</code> , <code>geosrs:LaHireProjection</code> , <code>geosrs:LorgnaProjection</code> , <code>geosrs:LowryProjection</code> , <code>geosrs:OrthographicProjection</code> , <code>geosrs:PerspectiveConicProjection</code> , <code>geosrs:PerspectiveProjection</code> , <code>geosrs:TiltedPerspectiveProjection</code> , <code>geosrs:VerticalPerspectiveProjection</code> to be used in SPARQL graph patterns.
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### 11.12.1. Class: `geosrs:CentralCylindricalProjection`

Table 222 — `geosrs:CentralCylindricalProjection`

URI	<a href="https://w3id.org/geosrs/projection/CentralCylindricalProjection">https://w3id.org/geosrs/projection/CentralCylindricalProjection</a>
Super-classes	<a href="#">PerspectiveProjection</a>
Example	<code>geosrs:CentralCylindricalProjection</code>

### 11.12.2. Class: `geosrs:GeneralVerticalPerspectiveProjection`

Table 223 — `geosrs:GeneralVerticalPerspectiveProjection`

URI	<a href="https://w3id.org/geosrs/projection/GeneralVerticalPerspectiveProjection">https://w3id.org/geosrs/projection/GeneralVerticalPerspectiveProjection</a>
Super-classes	<a href="#">PerspectiveProjection</a>

### 11.12.3. Class: `geosrs:GilbertTwoWorldPerspectiveProjection`

Table 224 — `geosrs:GilbertTwoWorldPerspectiveProjection`

URI	<a href="https://w3id.org/geosrs/projection/GilbertTwoWorldPerspectiveProjection">https://w3id.org/geosrs/projection/GilbertTwoWorldPerspectiveProjection</a>
Super-classes	<a href="#">PerspectiveProjection</a>

### 11.12.4. Class: `geosrs:LaHireProjection`

**Table 225** — geosrs:LaHireProjection

URI	<a href="https://w3id.org/geosrs/projection/LaHireProjection">https://w3id.org/geosrs/projection/LaHireProjection</a>
Super-classes	<a href="#">PerspectiveProjection</a>

### 11.12.5. Class: geosrs:LorgnaProjection

**Table 226** — geosrs:LorgnaProjection

URI	<a href="https://w3id.org/geosrs/projection/LorgnaProjection">https://w3id.org/geosrs/projection/LorgnaProjection</a>
Super-classes	<a href="#">PerspectiveProjection</a>

### 11.12.6. Class: geosrs:LowryProjection

**Table 227** — geosrs:LowryProjection

URI	<a href="https://w3id.org/geosrs/projection/LowryProjection">https://w3id.org/geosrs/projection/LowryProjection</a>
Super-classes	<a href="#">PerspectiveProjection</a>

### 11.12.7. Class: geosrs:OrthographicProjection

**Table 228** — geosrs:OrthographicProjection

URI	<a href="https://w3id.org/geosrs/projection/OrthographicProjection">https://w3id.org/geosrs/projection/OrthographicProjection</a>
Super-classes	<a href="#">PerspectiveProjection</a>

### 11.12.8. Class: geosrs:PerspectiveConicProjection

**Table 229** — geosrs:PerspectiveConicProjection

URI	<a href="https://w3id.org/geosrs/projection/PerspectiveConicProjection">https://w3id.org/geosrs/projection/PerspectiveConicProjection</a>
Super-classes	<a href="#">PerspectiveProjection</a>

### 11.12.9. Class: geosrs:PerspectiveProjection

Table 230 — geosrs:PerspectiveProjection

URI	<a href="https://w3id.org/geosrs/projection/PerspectiveProjection">https://w3id.org/geosrs/projection/PerspectiveProjection</a>
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### 11.12.10. Class: geosrs:TiltedPerspectiveProjection

Table 231 — geosrs:TiltedPerspectiveProjection

URI	<a href="https://w3id.org/geosrs/projection/TiltedPerspectiveProjection">https://w3id.org/geosrs/projection/TiltedPerspectiveProjection</a>
Super-classes	<a href="#">PerspectiveProjection</a>

### 11.12.11. Class: geosrs:VerticalPerspectiveProjection

Table 232 — geosrs:VerticalPerspectiveProjection

URI	<a href="https://w3id.org/geosrs/projection/VerticalPerspectiveProjection">https://w3id.org/geosrs/projection/VerticalPerspectiveProjection</a>
Super-classes	<a href="#">PerspectiveProjection</a>

## 11.13. Polyconic Projections

### REQUIREMENT 33: POLYCONIC PROJECTIONS

**IDENTIFIER** /req/projections/Polyconic\_Projections

**STATEMENT** Implementations shall allow the RDFS classes geosrs:GinzburgIVProjection, geosrs:GinzburgIXProjection, geosrs:GinzburgVIPProjection, geosrs:GinzburgVProjection, geosrs:GottWagnerProjection, geosrs:HillEucyclicProjection, geosrs:LagrangeProjection, geosrs:LaskowskiProjection, geosrs:PolyconicProjection, geosrs:RectangularPolyconicProjection, geosrs:StabiusWernerIIIProjection, geosrs:StabiusWernerIProjection, geosrs:VanDerGrintenIIProjection, geosrs:Van

## REQUIREMENT 33: POLYCONIC PROJECTIONS

DerGrintenIProjection, geosrs:VanDerGrintenIVProjection, geosrs:WagnerIXProjection, geosrs:WagnerVIIIProjection, geosrs:WagnerVIIProjection to be used in SPARQL graph patterns.

### 11.13.1. Class: geosrs:GinzburgIVProjection

Table 233 — geosrs:GinzburgIVProjection

URI	<a href="https://w3id.org/geosrs/projection/GinzburgIVProjection">https://w3id.org/geosrs/projection/GinzburgIVProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.13.2. Class: geosrs:GinzburgIXProjection

Table 234 — geosrs:GinzburgIXProjection

URI	<a href="https://w3id.org/geosrs/projection/GinzburgIXProjection">https://w3id.org/geosrs/projection/GinzburgIXProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.13.3. Class: geosrs:GinzburgVIProjection

Table 235 — geosrs:GinzburgVIProjection

URI	<a href="https://w3id.org/geosrs/projection/GinzburgVIProjection">https://w3id.org/geosrs/projection/GinzburgVIProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.13.4. Class: geosrs:GinzburgVProjection

Table 236 — geosrs:GinzburgVProjection

URI	<a href="https://w3id.org/geosrs/projection/GinzburgVProjection">https://w3id.org/geosrs/projection/GinzburgVProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.13.5. Class: geosrs:GottWagnerProjection

Table 237 — geosrs:GottWagnerProjection

URI	<a href="https://w3id.org/geosrs/projection/GottWagnerProjection">https://w3id.org/geosrs/projection/GottWagnerProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.13.6. Class: geosrs:HillEucyclicProjection

Table 238 — geosrs:HillEucyclicProjection

URI	<a href="https://w3id.org/geosrs/projection/HillEucyclicProjection">https://w3id.org/geosrs/projection/HillEucyclicProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.13.7. Class: geosrs:LagrangeProjection

Table 239 — geosrs:LagrangeProjection

URI	<a href="https://w3id.org/geosrs/projection/LagrangeProjection">https://w3id.org/geosrs/projection/LagrangeProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.13.8. Class: geosrs:LaskowskiProjection

Table 240 — geosrs:LaskowskiProjection

URI	<a href="https://w3id.org/geosrs/projection/LaskowskiProjection">https://w3id.org/geosrs/projection/LaskowskiProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.13.9. Class: geosrs:PolyconicProjection



**Table 241** — geosrs:PolyconicProjection

URI	<a href="https://w3id.org/geosrs/projection/PolyconicProjection">https://w3id.org/geosrs/projection/PolyconicProjection</a>
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### 11.13.10. Class: geosrs:RectangularPolyconicProjection

**Table 242** — geosrs:RectangularPolyconicProjection

URI	<a href="https://w3id.org/geosrs/projection/RectangularPolyconicProjection">https://w3id.org/geosrs/projection/RectangularPolyconicProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.13.11. Class: geosrs:StabiusWernerIIIProjection

**Table 243** — geosrs:StabiusWernerIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/StabiusWernerIIIProjection">https://w3id.org/geosrs/projection/StabiusWernerIIIProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.13.12. Class: geosrs:StabiusWernerIProjection

**Table 244** — geosrs:StabiusWernerIProjection

URI	<a href="https://w3id.org/geosrs/projection/StabiusWernerIProjection">https://w3id.org/geosrs/projection/StabiusWernerIProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.13.13. Class: geosrs:VanDerGrintenIIProjection

**Table 245** — geosrs:VanDerGrintenIIProjection

URI	<a href="https://w3id.org/geosrs/projection/VanDerGrintenIIProjection">https://w3id.org/geosrs/projection/VanDerGrintenIIProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.13.14. Class: geosrs:VanDerGrintenIProjection

Table 246 — geosrs:VanDerGrintenIProjection

URI	<a href="https://w3id.org/geosrs/projection/VanDerGrintenIProjection">https://w3id.org/geosrs/projection/VanDerGrintenIProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.13.15. Class: geosrs:VanDerGrintenIVProjection

Table 247 — geosrs:VanDerGrintenIVProjection

URI	<a href="https://w3id.org/geosrs/projection/VanDerGrintenIVProjection">https://w3id.org/geosrs/projection/VanDerGrintenIVProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.13.16. Class: geosrs:WagnerIXProjection

Table 248 — geosrs:WagnerIXProjection

URI	<a href="https://w3id.org/geosrs/projection/WagnerIXProjection">https://w3id.org/geosrs/projection/WagnerIXProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.13.17. Class: geosrs:WagnerVIIIProjection

Table 249 — geosrs:WagnerVIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/WagnerVIIIProjection">https://w3id.org/geosrs/projection/WagnerVIIIProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

### 11.13.18. Class: geosrs:WagnerVIIProjection

Table 250 — geosrs:WagnerVIIProjection

URI	<a href="https://w3id.org/geosrs/projection/WagnerVIIProjection">https://w3id.org/geosrs/projection/WagnerVIIProjection</a>
Super-classes	<a href="#">PolyconicProjection</a>

## 11.14. Polyhedral Projections

### REQUIREMENT 34: POLYHEDRAL PROJECTIONS

**IDENTIFIER** /req/projections/Polyhedral\_Projections

**STATEMENT** Implementations shall allow the RDFS classes geosrs:AuthaGraphProjection, geosrs:CahillKeyesProjection, geosrs:CollignonButterflyProjection, geosrs:DodecahedralProjection, geosrs:DymaxionProjection, geosrs:GnomonicButterflyProjection, geosrs:GnomonicCubedSphereProjection, geosrs:GnomonicIcosahedronProjection, geosrs:GuyouProjection, geosrs:IcosahedralProjection, geosrs:LeeProjection, geosrs:MyrahedalProjection, geosrs:OctantProjection, geosrs:PolyhedralProjection, geosrs:QuadrilateralizedSphericalCubeProjection, geosrs:WatermanButterflyProjection to be used in SPARQL graph patterns.

#### 11.14.1. Class: geosrs:AuthaGraphProjection

Table 251 — geosrs:AuthaGraphProjection

URI	<a href="https://w3id.org/geosrs/projection/AuthaGraphProjection">https://w3id.org/geosrs/projection/AuthaGraphProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

#### 11.14.2. Class: geosrs:CahillKeyesProjection

Table 252 — geosrs:CahillKeyesProjection

URI	<a href="https://w3id.org/geosrs/projection/CahillKeyesProjection">https://w3id.org/geosrs/projection/CahillKeyesProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.14.3. Class: geosrs:CollignonButterflyProjection

Table 253 — geosrs:CollignonButterflyProjection

URI	<a href="https://w3id.org/geosrs/projection/CollignonButterflyProjection">https://w3id.org/geosrs/projection/CollignonButterflyProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.14.4. Class: geosrs:DodecahedralProjection

Table 254 — geosrs:DodecahedralProjection

URI	<a href="https://w3id.org/geosrs/projection/DodecahedralProjection">https://w3id.org/geosrs/projection/DodecahedralProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.14.5. Class: geosrs:DymaxionProjection

Table 255 — geosrs:DymaxionProjection

URI	<a href="https://w3id.org/geosrs/projection/DymaxionProjection">https://w3id.org/geosrs/projection/DymaxionProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.14.6. Class: geosrs:GnomonicButterflyProjection

Table 256 — geosrs:GnomonicButterflyProjection

URI	<a href="https://w3id.org/geosrs/projection/GnomonicButterflyProjection">https://w3id.org/geosrs/projection/GnomonicButterflyProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.14.7. Class: geosrs:GnomonicCubedSphereProjection

**Table 257** — geosrs:GnomonicCubedSphereProjection

URI	<a href="https://w3id.org/geosrs/projection/GnomonicCubedSphereProjection">https://w3id.org/geosrs/projection/GnomonicCubedSphereProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.14.8. Class: geosrs:GnomonicIcosahedronProjection

**Table 258** — geosrs:GnomonicIcosahedronProjection

URI	<a href="https://w3id.org/geosrs/projection/GnomonicIcosahedronProjection">https://w3id.org/geosrs/projection/GnomonicIcosahedronProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.14.9. Class: geosrs:GuyouProjection

**Table 259** — geosrs:GuyouProjection

URI	<a href="https://w3id.org/geosrs/projection/GuyouProjection">https://w3id.org/geosrs/projection/GuyouProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.14.10. Class: geosrs:IcosahedralProjection

**Table 260** — geosrs:IcosahedralProjection

URI	<a href="https://w3id.org/geosrs/projection/IcosahedralProjection">https://w3id.org/geosrs/projection/IcosahedralProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.14.11. Class: geosrs:LeeProjection

**Table 261** — geosrs:LeeProjection

URI	<a href="https://w3id.org/geosrs/projection/LeeProjection">https://w3id.org/geosrs/projection/LeeProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.14.12. Class: geosrs:MyrahedalProjection

Table 262 — geosrs:MyrahedalProjection

URI	<a href="https://w3id.org/geosrs/projection/MyrahedalProjection">https://w3id.org/geosrs/projection/MyrahedalProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.14.13. Class: geosrs:OctantProjection

Table 263 — geosrs:OctantProjection

URI	<a href="https://w3id.org/geosrs/projection/OctantProjection">https://w3id.org/geosrs/projection/OctantProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.14.14. Class: geosrs:PolyhedralProjection

Table 264 — geosrs:PolyhedralProjection

URI	<a href="https://w3id.org/geosrs/projection/PolyhedralProjection">https://w3id.org/geosrs/projection/PolyhedralProjection</a>
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### 11.14.15. Class: geosrs:QuadrilateralizedSphericalCubeProjection

Table 265 — geosrs:QuadrilateralizedSphericalCubeProjection

URI	<a href="https://w3id.org/geosrs/projection/QuadrilateralizedSphericalCubeProjection">https://w3id.org/geosrs/projection/QuadrilateralizedSphericalCubeProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

### 11.14.16. Class: geosrs:WatermanButterflyProjection

**Table 266** — geosrs:WatermanButterflyProjection

URI	<a href="https://w3id.org/geosrs/projection/WatermanButterflyProjection">https://w3id.org/geosrs/projection/WatermanButterflyProjection</a>
Super-classes	<a href="#">PolyhedralProjection</a>

## 11.15. Projection

### REQUIREMENT 35: PROJECTION

**IDENTIFIER**     /req/projections/Projection

**STATEMENT**     Implementations shall allow the RDFS classes geosrs:Projection to be used in SPARQL graph patterns.

### 11.15.1. Class: geosrs:Projection

**Table 267** — geosrs:Projection

URI	<a href="https://w3id.org/geosrs/projection/Projection">https://w3id.org/geosrs/projection/Projection</a>
Super-classes	<a href="#">Conversion</a>

## 11.16. Pseudo Azimuthal Projections

### REQUIREMENT 36: PSEUDO AZIMUTHAL PROJECTIONS

**IDENTIFIER**     /req/projections/Pseudo\_Azimuthal\_Projections

**STATEMENT**     Implementations shall allow the RDFS classes geosrs:AitoffObliqueProjection, geosrs:Aitoff Projection, geosrs:BartholomewProjection, geosrs:HammerProjection, geosrs:PseudoAzimuthal Projection, geosrs:Strebe1995Projection, geosrs:WinkelTripelProjection to be used in SPARQL graph patterns.

### 11.16.1. Class: geosrs:AitoffObliqueProjection

Table 268 — geosrs:AitoffObliqueProjection

URI	<a href="https://w3id.org/geosrs/projection/AitoffObliqueProjection">https://w3id.org/geosrs/projection/AitoffObliqueProjection</a>
Super-classes	<a href="#">PseudoAzimuthalProjection</a>

### 11.16.2. Class: geosrs:AitoffProjection

Table 269 — geosrs:AitoffProjection

URI	<a href="https://w3id.org/geosrs/projection/AitoffProjection">https://w3id.org/geosrs/projection/AitoffProjection</a>
Definition	A modified azimuthal projection whose graticule takes the form of an ellipse
Super-classes	<a href="#">PseudoAzimuthalProjection</a>

### 11.16.3. Class: geosrs:BartholomewProjection

Table 270 — geosrs:BartholomewProjection

URI	<a href="https://w3id.org/geosrs/projection/BartholomewProjection">https://w3id.org/geosrs/projection/BartholomewProjection</a>
Super-classes	<a href="#">WinkelTripelProjection</a>

### 11.16.4. Class: geosrs:HammerProjection

Table 271 — geosrs:HammerProjection

URI	<a href="https://w3id.org/geosrs/projection/HammerProjection">https://w3id.org/geosrs/projection/HammerProjection</a>
Super-classes	<a href="#">PseudoAzimuthalProjection</a>



### 11.16.5. Class: geosrs:PseudoAzimuthalProjection

Table 272 — geosrs:PseudoAzimuthalProjection

URI	<a href="https://w3id.org/geosrs/projection/PseudoAzimuthalProjection">https://w3id.org/geosrs/projection/PseudoAzimuthalProjection</a>
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### 11.16.6. Class: geosrs:Strebe1995Projection

Table 273 — geosrs:Strebe1995Projection

URI	<a href="https://w3id.org/geosrs/projection/Strebe1995Projection">https://w3id.org/geosrs/projection/Strebe1995Projection</a>
Super-classes	<a href="#">PseudoAzimuthalProjection</a>

### 11.16.7. Class: geosrs:WinkelTripelProjection

Table 274 — geosrs:WinkelTripelProjection

URI	<a href="https://w3id.org/geosrs/projection/WinkelTripelProjection">https://w3id.org/geosrs/projection/WinkelTripelProjection</a>
Super-classes	<a href="#">PseudoAzimuthalProjection</a>

## 11.17. Pseudo Conical Projections

#### REQUIREMENT 37: PSEUDO CONICAL PROJECTIONS

IDENTIFIER	/req/projections/Pseudo_Conical_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:AmericanPolyconicProjection, geosrs:BonneProjection, geosrs:BottomleyProjection, geosrs:NicolosiGlobularProjection, geosrs:PseudoConicalProjection, geosrs:PtolemyIIProjection, geosrs:StabiusWernerIIProjection, geosrs:WernerProjection to be used in SPARQL graph patterns.

### 11.17.1. Class: geosrs:AmericanPolyconicProjection

Table 275 — geosrs:AmericanPolyconicProjection

URI	<a href="https://w3id.org/geosrs/projection/AmericanPolyconicProjection">https://w3id.org/geosrs/projection/AmericanPolyconicProjection</a>
Super-classes	<a href="#">PseudoConicalProjection</a>
Example	<code>geosrs:AmericanPolyconicProjection</code>

### 11.17.2. Class: geosrs:BonneProjection

Table 276 — geosrs:BonneProjection

URI	<a href="https://w3id.org/geosrs/projection/BonneProjection">https://w3id.org/geosrs/projection/BonneProjection</a>
Super-classes	<a href="#">PseudoConicalProjection</a>

### 11.17.3. Class: geosrs:BottomleyProjection

Table 277 — geosrs:BottomleyProjection

URI	<a href="https://w3id.org/geosrs/projection/BottomleyProjection">https://w3id.org/geosrs/projection/BottomleyProjection</a>
Super-classes	<a href="#">PseudoConicalProjection</a>

### 11.17.4. Class: geosrs:NicolosiGlobularProjection

Table 278 — geosrs:NicolosiGlobularProjection

URI	<a href="https://w3id.org/geosrs/projection/NicolosiGlobularProjection">https://w3id.org/geosrs/projection/NicolosiGlobularProjection</a>
Super-classes	<a href="#">PseudoConicalProjection</a>

### 11.17.5. Class: geosrs:PseudoConicalProjection

Table 279 — geosrs:PseudoConicalProjection

URI	<a href="https://w3id.org/geosrs/projection/PseudoConicalProjection">https://w3id.org/geosrs/projection/ PseudoConicalProjection</a>
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### 11.17.6. Class: geosrs:PtolemyIIProjection

Table 280 — geosrs:PtolemyIIProjection

URI	<a href="https://w3id.org/geosrs/projection/PtolemyIIProjection">https://w3id.org/geosrs/projection/PtolemyIIProjection</a>
Super-classes	<a href="#">PseudoConicalProjection</a>

### 11.17.7. Class: geosrs:StabiusWernerIIProjection

Table 281 — geosrs:StabiusWernerIIProjection

URI	<a href="https://w3id.org/geosrs/projection/StabiusWernerIIProjection">https://w3id.org/geosrs/projection/ StabiusWernerIIProjection</a>
Super-classes	<a href="#">BonneProjection</a>

### 11.17.8. Class: geosrs:WernerProjection

Table 282 — geosrs:WernerProjection

URI	<a href="https://w3id.org/geosrs/projection/WernerProjection">https://w3id.org/geosrs/projection/WernerProjection</a>
Super-classes	<a href="#">PseudoConicalProjection</a>

## 11.18. Pseudo Cylindrical Projections

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## REQUIREMENT 38: PSEUDO CYLINDRICAL PROJECTIONS

**IDENTIFIER** /req/projections/Pseudo\_Cylindrical\_Projections

**STATEMENT**

Implementations shall allow the RDFS classes geosrs:ApianIIProjection, geosrs:AtlantisProjection, geosrs:BaranyIIIProjection, geosrs:BaranyIIProjection, geosrs:BaranyiIVProjection, geosrs:BoggsEumorphicProjection, geosrs:BromleyProjection, geosrs:CabotProjection, geosrs:CollignonProjection, geosrs:CrasterParabolicProjection, geosrs:DeakinMinimumErrorProjection, geosrs:Eckert1Projection, geosrs:Eckert2Projection, geosrs:Eckert3Projection, geosrs:Eckert4Projection, geosrs:Eckert5Projection, geosrs:Eckert6Projection, geosrs:EqualEarthProjection, geosrs:FaheyProjection, geosrs:FoucautProjection, geosrs:FoucautSinusoidalProjection, geosrs:FournierIIProjection, geosrs:GinzburgVIIIProjection, geosrs:GoodeHomolosineProjection, geosrs:HEALPixProjection, geosrs:HatanoAsymmetricalEqualAreaProjection, geosrs:HufnagelProjection, geosrs:Kavrayskiy7Projection, geosrs:LoximuthalProjection, geosrs:MayrProjection, geosrs:McBrydeThomasFlatPolarParabolicProjection, geosrs:McBrydeThomasFlatPolarQuarticProjection, geosrs:McBrydeThomasFlatPolarSinusoidalProjection, geosrs:McBrydeThomasIIProjection, geosrs:McBrydeThomasIProjection, geosrs:NaturalEarth2Projection, geosrs:NaturalEarthProjection, geosrs:NellHammerProjection, geosrs:NellProjection, geosrs:OrteliusOvalProjection, geosrs:PseudoCylindricalProjection, geosrs:PutninsP1Projection, geosrs:PutninsP2Projection, geosrs:PutninsP3Projection, geosrs:PutninsP5Projection, geosrs:PutninsP6Projection, geosrs:QuarticAuthalicProjection, geosrs:RobinsonProjection, geosrs:SinusoidalProjection, geosrs:TheTimesProjection, geosrs:ToblerG1Projection, geosrs:ToblerHyperellipticalProjection, geosrs:WagnerIIIProjection, geosrs:WagnerIIProjection, geosrs:WagnerIProjection, geosrs:WagnerIVProjection, geosrs:WagnerVProjection, geosrs:WagnerVProjection, geosrs:WerenskioldIProjection, geosrs:PutninsP3'Projection, geosrs:PutninsP4'Projection, geosrs:PutninsP5'Projection, geosrs:PutninsP6'Projection to be used in SPARQL graph patterns.

### 11.18.1. Class: geosrs:ApianIIProjection

Table 283 — geosrs:ApianIIProjection

URI	<a href="https://w3id.org/geosrs/projection/ApianIIProjection">https://w3id.org/geosrs/projection/ApianIIProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.2. Class: geosrs:AtlantisProjection

Table 284 — geosrs:AtlantisProjection

URI	<a href="https://w3id.org/geosrs/projection/AtlantisProjection">https://w3id.org/geosrs/projection/AtlantisProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.3. Class: geosrs:BaranyillProjection

Table 285 — geosrs:BaranyillProjection

URI	<a href="https://w3id.org/geosrs/projection/BaranyillProjection">https://w3id.org/geosrs/projection/BaranyillProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.4. Class: geosrs:BaranyilProjection

Table 286 — geosrs:BaranyilProjection

URI	<a href="https://w3id.org/geosrs/projection/BaranyilProjection">https://w3id.org/geosrs/projection/BaranyilProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.5. Class: geosrs:BaranyilProjection

Table 287 — geosrs:BaranyilProjection

URI	<a href="https://w3id.org/geosrs/projection/BaranyilProjection">https://w3id.org/geosrs/projection/BaranyilProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.6. Class: geosrs:BaranyilVProjection

Table 288 — geosrs:BaranyilVProjection

URI	<a href="https://w3id.org/geosrs/projection/BaranyilVProjection">https://w3id.org/geosrs/projection/BaranyilVProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.7. Class: geosrs:BoggsEumorphicProjection

**Table 289** — geosrs:BoggsEumorphicProjection

URI	<a href="https://w3id.org/geosrs/projection/BoggsEumorphicProjection">https://w3id.org/geosrs/projection/BoggsEumorphicProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.8. Class: geosrs:BromleyProjection

**Table 290** — geosrs:BromleyProjection

URI	<a href="https://w3id.org/geosrs/projection/BromleyProjection">https://w3id.org/geosrs/projection/BromleyProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.9. Class: geosrs:CabotProjection

**Table 291** — geosrs:CabotProjection

URI	<a href="https://w3id.org/geosrs/projection/CabotProjection">https://w3id.org/geosrs/projection/CabotProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.10. Class: geosrs:CollignonProjection

**Table 292** — geosrs:CollignonProjection

URI	<a href="https://w3id.org/geosrs/projection/CollignonProjection">https://w3id.org/geosrs/projection/CollignonProjection</a>
Definition	An equal-area pseudocylindrical projection that maps the sphere onto a triangle or diamond
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.11. Class: geosrs:CrasterParabolicProjection

**Table 293** — geosrs:CrasterParabolicProjection

URI	<a href="https://w3id.org/geosrs/projection/CrasterParabolicProjection">https://w3id.org/geosrs/projection/CrasterParabolicProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.12. Class: geosrs:DeakinMinimumErrorProjection

**Table 294** — geosrs:DeakinMinimumErrorProjection

URI	<a href="https://w3id.org/geosrs/projection/DeakinMinimumErrorProjection">https://w3id.org/geosrs/projection/DeakinMinimumErrorProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.13. Class: geosrs:Eckert1Projection

**Table 295** — geosrs:Eckert1Projection

URI	<a href="https://w3id.org/geosrs/projection/Eckert1Projection">https://w3id.org/geosrs/projection/Eckert1Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.14. Class: geosrs:Eckert2Projection

**Table 296** — geosrs:Eckert2Projection

URI	<a href="https://w3id.org/geosrs/projection/Eckert2Projection">https://w3id.org/geosrs/projection/Eckert2Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.15. Class: geosrs:Eckert3Projection

**Table 297** — geosrs:Eckert3Projection

URI	<a href="https://w3id.org/geosrs/projection/Eckert3Projection">https://w3id.org/geosrs/projection/Eckert3Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.16. Class: geosrs:Eckert4Projection

**Table 298** — geosrs:Eckert4Projection

URI	<a href="https://w3id.org/geosrs/projection/Eckert4Projection">https://w3id.org/geosrs/projection/Eckert4Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.17. Class: geosrs:Eckert5Projection

**Table 299** — geosrs:Eckert5Projection

URI	<a href="https://w3id.org/geosrs/projection/Eckert5Projection">https://w3id.org/geosrs/projection/Eckert5Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.18. Class: geosrs:Eckert6Projection

**Table 300** — geosrs:Eckert6Projection

URI	<a href="https://w3id.org/geosrs/projection/Eckert6Projection">https://w3id.org/geosrs/projection/Eckert6Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.19. Class: geosrs:EqualEarthProjection

**Table 301** — geosrs:EqualEarthProjection

URI	<a href="https://w3id.org/geosrs/projection/EqualEarthProjection">https://w3id.org/geosrs/projection/EqualEarthProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>
Example	<a href="#">geosrs:EqualEarthProjection</a>



## 11.18.20. Class: geosrs:FaheyProjection

Table 302 — geosrs:FaheyProjection

URI	<a href="https://w3id.org/geosrs/projection/FaheyProjection">https://w3id.org/geosrs/projection/FaheyProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

## 11.18.21. Class: geosrs:FoucautProjection

Table 303 — geosrs:FoucautProjection

URI	<a href="https://w3id.org/geosrs/projection/FoucautProjection">https://w3id.org/geosrs/projection/FoucautProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

## 11.18.22. Class: geosrs:FoucautSinusoidalProjection

Table 304 — geosrs:FoucautSinusoidalProjection

URI	<a href="https://w3id.org/geosrs/projection/FoucautSinusoidalProjection">https://w3id.org/geosrs/projection/FoucautSinusoidalProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

## 11.18.23. Class: geosrs:FournierIIProjection

Table 305 — geosrs:FournierIIProjection

URI	<a href="https://w3id.org/geosrs/projection/FournierIIProjection">https://w3id.org/geosrs/projection/FournierIIProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

## 11.18.24. Class: geosrs:GinzburgVIIIProjection

**Table 306** — geosrs:GinzburgVIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/GinzburgVIIIProjection">https://w3id.org/geosrs/projection/GinzburgVIIIProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.25. Class: geosrs:GoodeHomolosineProjection

**Table 307** — geosrs:GoodeHomolosineProjection

URI	<a href="https://w3id.org/geosrs/projection/GoodeHomolosineProjection">https://w3id.org/geosrs/projection/GoodeHomolosineProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.26. Class: geosrs:HEALPixProjection

**Table 308** — geosrs:HEALPixProjection

URI	<a href="https://w3id.org/geosrs/projection/HEALPixProjection">https://w3id.org/geosrs/projection/HEALPixProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.27. Class: geosrs:HatanoAsymmetricalEqualAreaProjection

**Table 309** — geosrs:HatanoAsymmetricalEqualAreaProjection

URI	<a href="https://w3id.org/geosrs/projection/HatanoAsymmetricalEqualAreaProjection">https://w3id.org/geosrs/projection/HatanoAsymmetricalEqualAreaProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.28. Class: geosrs:HufnagelProjection

**Table 310** — geosrs:HufnagelProjection

URI	<a href="https://w3id.org/geosrs/projection/HufnagelProjection">https://w3id.org/geosrs/projection/HufnagelProjection</a>
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Super-classes	<a href="#">PseudoCylindricalProjection</a>
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### 11.18.29. Class: geosrs:Kavrayskiy7Projection

**Table 311** — geosrs:Kavrayskiy7Projection

URI	<a href="https://w3id.org/geosrs/projection/Kavrayskiy7Projection">https://w3id.org/geosrs/projection/Kavrayskiy7Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.30. Class: geosrs:LoximuthalProjection

**Table 312** — geosrs:LoximuthalProjection

URI	<a href="https://w3id.org/geosrs/projection/LoximuthalProjection">https://w3id.org/geosrs/projection/LoximuthalProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.31. Class: geosrs:MayrProjection

**Table 313** — geosrs:MayrProjection

URI	<a href="https://w3id.org/geosrs/projection/MayrProjection">https://w3id.org/geosrs/projection/MayrProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.32. Class: geosrs:McBrydeThomasFlatPolarParabolicProjection

**Table 314** — geosrs:McBrydeThomasFlatPolarParabolicProjection

URI	<a href="https://w3id.org/geosrs/projection/McBrydeThomasFlatPolarParabolicProjection">https://w3id.org/geosrs/projection/McBrydeThomasFlatPolarParabolicProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.33. Class: geosrs:McBrydeThomasFlatPolarQuarticProjection

Table 315 — geosrs:McBrydeThomasFlatPolarQuarticProjection

URI	<a href="https://w3id.org/geosrs/projection/McBrydeThomasFlatPolarQuarticProjection">https://w3id.org/geosrs/projection/McBrydeThomasFlatPolarQuarticProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.34. Class: geosrs:McBrydeThomasFlatPolarSinusoidalProjection

Table 316 — geosrs:McBrydeThomasFlatPolarSinusoidalProjection

URI	<a href="https://w3id.org/geosrs/projection/McBrydeThomasFlatPolarSinusoidalProjection">https://w3id.org/geosrs/projection/McBrydeThomasFlatPolarSinusoidalProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.35. Class: geosrs:McBrydeThomasIIProjection

Table 317 — geosrs:McBrydeThomasIIProjection

URI	<a href="https://w3id.org/geosrs/projection/McBrydeThomasIIProjection">https://w3id.org/geosrs/projection/McBrydeThomasIIProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.36. Class: geosrs:McBrydeThomasIProjection

Table 318 — geosrs:McBrydeThomasIProjection

URI	<a href="https://w3id.org/geosrs/projection/McBrydeThomasIProjection">https://w3id.org/geosrs/projection/McBrydeThomasIProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.37. Class: geosrs:NaturalEarth2Projection

**Table 319** — geosrs:NaturalEarth2Projection

URI	<a href="https://w3id.org/geosrs/projection/NaturalEarth2Projection">https://w3id.org/geosrs/projection/NaturalEarth2Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.38. Class: geosrs:NaturalEarthProjection

**Table 320** — geosrs:NaturalEarthProjection

URI	<a href="https://w3id.org/geosrs/projection/NaturalEarthProjection">https://w3id.org/geosrs/projection/NaturalEarthProjection</a>
Definition	A pseudocylindrical map projection designed by Tom Patterson and introduced in 2008
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.39. Class: geosrs:NellHammerProjection

**Table 321** — geosrs:NellHammerProjection

URI	<a href="https://w3id.org/geosrs/projection/NellHammerProjection">https://w3id.org/geosrs/projection/NellHammerProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.40. Class: geosrs:NellProjection

**Table 322** — geosrs:NellProjection

URI	<a href="https://w3id.org/geosrs/projection/NellProjection">https://w3id.org/geosrs/projection/NellProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.41. Class: geosrs:OrteliusOvalProjection

**Table 323** — geosrs:OrteliusOvalProjection

URI	<a href="https://w3id.org/geosrs/projection/OrteliusOvalProjection">https://w3id.org/geosrs/projection/OrteliusOvalProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

#### 11.18.42. Class: geosrs:PseudoCylindricalProjection

**Table 324** — geosrs:PseudoCylindricalProjection

URI	<a href="https://w3id.org/geosrs/projection/PseudoCylindricalProjection">https://w3id.org/geosrs/projection/PseudoCylindricalProjection</a>
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#### 11.18.43. Class: geosrs:PutninsP1Projection

**Table 325** — geosrs:PutninsP1Projection

URI	<a href="https://w3id.org/geosrs/projection/PutninsP1Projection">https://w3id.org/geosrs/projection/PutninsP1Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

#### 11.18.44. Class: geosrs:PutninsP2Projection

**Table 326** — geosrs:PutninsP2Projection

URI	<a href="https://w3id.org/geosrs/projection/PutninsP2Projection">https://w3id.org/geosrs/projection/PutninsP2Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

#### 11.18.45. Class: geosrs:PutninsP3Projection

**Table 327** — geosrs:PutninsP3Projection

URI	<a href="https://w3id.org/geosrs/projection/PutninsP3Projection">https://w3id.org/geosrs/projection/PutninsP3Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

## 11.18.46. Class: geosrs:PutninsP5Projection

Table 328 — geosrs:PutninsP5Projection

URI	<a href="https://w3id.org/geosrs/projection/PutninsP5Projection">https://w3id.org/geosrs/projection/PutninsP5Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

## 11.18.47. Class: geosrs:PutninsP6Projection

Table 329 — geosrs:PutninsP6Projection

URI	<a href="https://w3id.org/geosrs/projection/PutninsP6Projection">https://w3id.org/geosrs/projection/PutninsP6Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

## 11.18.48. Class: geosrs:QuarticAuthalicProjection

Table 330 — geosrs:QuarticAuthalicProjection

URI	<a href="https://w3id.org/geosrs/projection/QuarticAuthalicProjection">https://w3id.org/geosrs/projection/QuarticAuthalicProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

## 11.18.49. Class: geosrs:RobinsonProjection

Table 331 — geosrs:RobinsonProjection

URI	<a href="https://w3id.org/geosrs/projection/RobinsonProjection">https://w3id.org/geosrs/projection/RobinsonProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

## 11.18.50. Class: geosrs:SinusoidalProjection

**Table 332** — geosrs:SinusoidalProjection

URI	<a href="https://w3id.org/geosrs/projection/SinusoidalProjection">https://w3id.org/geosrs/projection/SinusoidalProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.51. Class: geosrs:TheTimesProjection

**Table 333** — geosrs:TheTimesProjection

URI	<a href="https://w3id.org/geosrs/projection/TheTimesProjection">https://w3id.org/geosrs/projection/TheTimesProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.52. Class: geosrs:ToblerG1Projection

**Table 334** — geosrs:ToblerG1Projection

URI	<a href="https://w3id.org/geosrs/projection/ToblerG1Projection">https://w3id.org/geosrs/projection/ToblerG1Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.53. Class: geosrs:ToblerHyperellipticalProjection

**Table 335** — geosrs:ToblerHyperellipticalProjection

URI	<a href="https://w3id.org/geosrs/projection/ToblerHyperellipticalProjection">https://w3id.org/geosrs/projection/ToblerHyperellipticalProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.54. Class: geosrs:WagnerIIIProjection

**Table 336** — geosrs:WagnerIIIProjection

URI	<a href="https://w3id.org/geosrs/projection/WagnerIIIProjection">https://w3id.org/geosrs/projection/WagnerIIIProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>



### 11.18.55. Class: geosrs:WagnerIIProjection

Table 337 — geosrs:WagnerIIProjection

URI	<a href="https://w3id.org/geosrs/projection/WagnerIIProjection">https://w3id.org/geosrs/projection/WagnerIIProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.56. Class: geosrs:WagnerIProjection

Table 338 — geosrs:WagnerIProjection

URI	<a href="https://w3id.org/geosrs/projection/WagnerIProjection">https://w3id.org/geosrs/projection/WagnerIProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.57. Class: geosrs:WagnerIVProjection

Table 339 — geosrs:WagnerIVProjection

URI	<a href="https://w3id.org/geosrs/projection/WagnerIVProjection">https://w3id.org/geosrs/projection/WagnerIVProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.58. Class: geosrs:WagnerVIProjection

Table 340 — geosrs:WagnerVIProjection

URI	<a href="https://w3id.org/geosrs/projection/WagnerVIProjection">https://w3id.org/geosrs/projection/WagnerVIProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.59. Class: geosrs:WagnerVProjection

**Table 341** — geosrs:WagnerVProjection

URI	<a href="https://w3id.org/geosrs/projection/WagnerVProjection">https://w3id.org/geosrs/projection/WagnerVProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.60. Class: geosrs:WerenskioldIProjection

**Table 342** — geosrs:WerenskioldIProjection

URI	<a href="https://w3id.org/geosrs/projection/WerenskioldIProjection">https://w3id.org/geosrs/projection/WerenskioldIProjection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.61. Class: geosrs:PutninsP3'Projection

**Table 343** — geosrs:PutninsP3'Projection

URI	<a href="https://w3id.org/geosrs/projection/PutninsP3'Projection">https://w3id.org/geosrs/projection/PutninsP3'Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.62. Class: geosrs:PutninsP4'Projection

**Table 344** — geosrs:PutninsP4'Projection

URI	<a href="https://w3id.org/geosrs/projection/PutninsP4'Projection">https://w3id.org/geosrs/projection/PutninsP4'Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

### 11.18.63. Class: geosrs:PutninsP5'Projection

**Table 345** — geosrs:PutninsP5'Projection

URI	<a href="https://w3id.org/geosrs/projection/PutninsP5'Projection">https://w3id.org/geosrs/projection/PutninsP5'Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

## 11.18.64. Class: geosrs:PutninsP6'Projection

Table 346 — geosrs:PutninsP6'Projection

URI	<a href="https://w3id.org/geosrs/projection/PutninsP6'Projection">https://w3id.org/geosrs/projection/PutninsP6'Projection</a>
Super-classes	<a href="#">PseudoCylindricalProjection</a>

## 11.19. Stereographic Projections

### REQUIREMENT 39: STEREOGRAPHIC PROJECTIONS

IDENTIFIER	/req/projections/Stereographic_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:GallStereographicProjection, geosrs:MillerOblatedStereographicProjection, geosrs:RoussilheProjection to be used in SPARQL graph patterns.

### 11.19.1. Class: geosrs:GallStereographicProjection

Table 347 — geosrs:GallStereographicProjection

URI	<a href="https://w3id.org/geosrs/projection/GallStereographicProjection">https://w3id.org/geosrs/projection/GallStereographicProjection</a>
Super-classes	<a href="#">StereographicProjection</a>

### 11.19.2. Class: geosrs:MillerOblatedStereographicProjection

Table 348 — geosrs:MillerOblatedStereographicProjection

URI	<a href="https://w3id.org/geosrs/projection/MillerOblatedStereographicProjection">https://w3id.org/geosrs/projection/MillerOblatedStereographicProjection</a>
Super-classes	<a href="#">StereographicProjection</a>

### 11.19.3. Class: geosrs:RoussilheProjection

Table 349 — geosrs:RoussilheProjection

URI	<a href="https://w3id.org/geosrs/projection/RoussilheProjection">https://w3id.org/geosrs/projection/RoussilheProjection</a>
Super-classes	<a href="#">StereographicProjection</a>



12

# PLANET MODULE

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This clause establishes the **PLANET** Requirements class, with IRI `/req/planet`, which has a corresponding Conformance Class, **PLANET**, with IRI `/conf/planet`.

#### REQUIREMENTS CLASS 7: 12-PLANET\_MODULE.ADOC EXTENSION

IDENTIFIER	<code>/req/planet</code>
TARGET TYPE	Implementation Specification
CONFORMANCE CLASS	Conformance class A.7: <code>/conf/planet</code>
REQUIREMENT	<code>/req/planet/Interstellar_Body</code>

### 12.1. Interstellar Body

#### REQUIREMENT 40: INTERSTELLAR BODY

IDENTIFIER	<code>/req/planet/Interstellar_Body</code>
STATEMENT	Implementations shall allow the RDFS classes <code>geosrs:ArtificialSatellite</code> , <code>geosrs:Asteroid</code> , <code>geosrs:Comet</code> , <code>geosrs:DwarfPlanet</code> , <code>geosrs:InterstellarBody</code> , <code>geosrs:Moon</code> , <code>geosrs:NaturalSatellite</code> , <code>geosrs:Planet</code> , <code>geosrs:PlanetStatus</code> , <code>geosrs:Plutoid</code> , <code>geosrs:Star</code> to be used in SPARQL graph patterns.

#### 12.1.1. Class: `geosrs:ArtificialSatellite`

Table 350 — `geosrs:ArtificialSatellite`

URI	<a href="https://w3id.org/geosrs/planet/ArtificialSatellite">https://w3id.org/geosrs/planet/ArtificialSatellite</a>
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#### 12.1.2. Class: `geosrs:Asteroid`

**Table 351** — geosrs:Asteroid

URI	<a href="https://w3id.org/geosrs/planet/Asteroid">https://w3id.org/geosrs/planet/Asteroid</a>
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### 12.1.3. Class: geosrs:Comet

**Table 352** — geosrs:Comet

URI	<a href="https://w3id.org/geosrs/planet/Comet">https://w3id.org/geosrs/planet/Comet</a>
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### 12.1.4. Class: geosrs:DwarfPlanet

**Table 353** — geosrs:DwarfPlanet

URI	<a href="https://w3id.org/geosrs/planet/DwarfPlanet">https://w3id.org/geosrs/planet/DwarfPlanet</a>
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### 12.1.5. Class: geosrs:InterstellarBody

**Table 354** — geosrs:InterstellarBody

URI	<a href="https://w3id.org/geosrs/planet/InterstellarBody">https://w3id.org/geosrs/planet/InterstellarBody</a>
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### 12.1.6. Class: geosrs:Moon

**Table 355** — geosrs:Moon

URI	<a href="https://w3id.org/geosrs/planet/Moon">https://w3id.org/geosrs/planet/Moon</a>
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### 12.1.7. Class: geosrs:NaturalSatellite

**Table 356** — geosrs:NaturalSatellite

URI	<a href="https://w3id.org/geosrs/planet/NaturalSatellite">https://w3id.org/geosrs/planet/NaturalSatellite</a>
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### 12.1.8. Class: geosrs:Planet

Table 357 — geosrs:Planet

URI	<a href="https://w3id.org/geosrs/planet/Planet">https://w3id.org/geosrs/planet/Planet</a>
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### 12.1.9. Class: geosrs:PlanetStatus

Table 358 — geosrs:PlanetStatus

URI	<a href="https://w3id.org/geosrs/planet/PlanetStatus">https://w3id.org/geosrs/planet/PlanetStatus</a>
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### 12.1.10. Class: geosrs:Plutoid

Table 359 — geosrs:Plutoid

URI	<a href="https://w3id.org/geosrs/planet/Plutoid">https://w3id.org/geosrs/planet/Plutoid</a>
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### 12.1.11. Class: geosrs:Star

Table 360 — geosrs:Star

URI	<a href="https://w3id.org/geosrs/planet/Star">https://w3id.org/geosrs/planet/Star</a>
-----	---





13

# COMMON INSTANCES

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This clause establishes common instances which are needed in CRS specifications as Requirement class **INSTANCES**, with IRI `/req/instances`, which has a corresponding Conformance Class, **INSTANCES**, with IRI `/conf/instances`.

#### REQUIREMENTS CLASS 8: 13-INSTANCES.ADOC EXTENSION

IDENTIFIER	<code>/req/instances</code>
TARGET TYPE	Implementation Specification
CONFORMANCE CLASS	Conformance class A.8: <code>/conf/instances</code>
REQUIREMENT	<code>/req/instances/Coordinate_System_Axis</code>
	<code>/req/instances/Spheroids</code>
	<code>/req/instances/SRS_Literal_Types</code>

### 13.1. Coordinate System Axis

#### REQUIREMENT 41: COORDINATE SYSTEM AXIS

IDENTIFIER	<code>/req/instances/Coordinate_System_Axis</code>
STATEMENT	Implementations shall allow the RDFS instances <code>geosrs:down</code> , <code>geosrs:east</code> , <code>geosrs:north</code> , <code>geosrs:south</code> , <code>geosrs:up</code> , <code>geosrs:west</code> to be used in SPARQL graph patterns.

#### 13.1.1. Instance: `geosrs:down`

Table 361 — `geosrs:down`

URI	<a href="https://w3id.org/geosrs/down">https://w3id.org/geosrs/down</a>
Type	<code>geosrs:AxisDirection</code>

Definition	Downwards axis direction
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### 13.1.2. Instance: geosrs:east

**Table 362** — geosrs:east

URI	<a href="https://w3id.org/geosrs/east">https://w3id.org/geosrs/east</a>
Type	<a href="#">geosrs:AxisDirection</a>
Definition	east axis direction

### 13.1.3. Instance: geosrs:north

**Table 363** — geosrs:north

URI	<a href="https://w3id.org/geosrs/north">https://w3id.org/geosrs/north</a>
Type	<a href="#">geosrs:AxisDirection</a>
Definition	North axis direction

### 13.1.4. Instance: geosrs:south

**Table 364** — geosrs:south

URI	<a href="https://w3id.org/geosrs/south">https://w3id.org/geosrs/south</a>
Type	<a href="#">geosrs:AxisDirection</a>
Definition	South axis direction

### 13.1.5. Instance: geosrs:up

**Table 365** — geosrs:up

URI	<a href="https://w3id.org/geosrs/up">https://w3id.org/geosrs/up</a>
Type	<a href="#">geosrs:AxisDirection</a>
Definition	Up axis direction

### 13.1.6. Instance: geosrs:west

**Table 366** — geosrs:west

URI	<a href="https://w3id.org/geosrs/west">https://w3id.org/geosrs/west</a>
Type	<a href="#">geosrs:AxisDirection</a>
Definition	West axis direction

## 13.2. SRS Literal Types

### REQUIREMENT 42: SRS LITERAL TYPES

**IDENTIFIER**      `/req/instances/SRS_Literal_Types`

**STATEMENT**      Implementations shall allow the RDFS instances `geosrs:proj4Literal`, `geosrs:projJSONLiteral`, `geosrs:wktLiteral` to be used in SPARQL graph patterns.

### 13.2.1. Instance: geosrs:proj4Literal

**Table 367** — geosrs:proj4Literal

URI	<a href="https://w3id.org/geosrs/proj4Literal">https://w3id.org/geosrs/proj4Literal</a>
Type	<code>rdf:Datatype[rdf:Datatype]</code>
Definition	A literal which stores a proj4 String

Example

[geosrs:proj4Literal](https://w3id.org/geosrs/proj4Literal)

### 13.2.2. Instance: geosrs:projJSONLiteral

Table 368 — geosrs:projJSONLiteral

URI	<a href="https://w3id.org/geosrs/projJSONLiteral">https://w3id.org/geosrs/projJSONLiteral</a>
Type	<code>rdf:Datatype[rdf:Datatype]</code>
Definition	A literal which stores a projection JSON (ProjJSON) String
Example	<a href="https://w3id.org/geosrs/projJSONLiteral">geosrs:projJSONLiteral</a>

### 13.2.3. Instance: geosrs:wktLiteral

Table 369 — geosrs:wktLiteral

URI	<a href="https://w3id.org/geosrs/wktLiteral">https://w3id.org/geosrs/wktLiteral</a>
Type	<code>rdf:Datatype[rdf:Datatype]</code>
Definition	A literal which stores a WKT for CRS String
Example	<a href="https://w3id.org/geosrs/wktLiteral">geosrs:wktLiteral</a>

## 13.3. Spheroids

#### REQUIREMENT 43: SPHEROIDS

**IDENTIFIER** /req/instances/Spheroids

**STATEMENT** Implementations shall allow the RDFS instances `geosrs:GRS1980`, `geosrs:GRS67`, `geosrs:PZ90`, `geosrs:Airy1830`, `geosrs:AiryModified1849`, `geosrs:International1924`, `geosrs:AustralianNationalSpheroid`, `geosrs:Everest1930`, `geosrs:Clarke1866`, `geosrs:Plessis1817`, `geosrs:Danish1876`, `geosrs:Struve1860`, `geosrs:IAG1975`, `geosrs:Clarke1858`, `geosrs:Clarke1880`, `geosrs:Helmert1906`, `geosrs:CGCS2000`, `geosrs:GSK-2011`, `geosrs:Zach1812`, `geosrs:Clarke1880ARC`, `geosrs:Clarke1880IGN`,

## REQUIREMENT 43: SPHEROIDS

geosrs:WGS66, geosrs:WGS72, geosrs:WGS84, geosrs:Krassowsky1940 to be used in SPARQL graph patterns.

### 13.3.1. Instance: geosrs:GRS1980

Table 370 — geosrs:GRS1980

URI	<a href="https://w3id.org/geosrs/GRS1980">https://w3id.org/geosrs/GRS1980</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	GRS 1980 Ellipsoid
Example	<a href="#">geosrs:GRS1980</a>

### 13.3.2. Instance: geosrs:GRS67

Table 371 — geosrs:GRS67

URI	<a href="https://w3id.org/geosrs/GRS67">https://w3id.org/geosrs/GRS67</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	GRS 67 Ellipsoid
Example	<a href="#">geosrs:GRS67</a>

### 13.3.3. Instance: geosrs:PZ90

Table 372 — geosrs:PZ90

URI	<a href="https://w3id.org/geosrs/PZ90">https://w3id.org/geosrs/PZ90</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	PZ 90 Ellipsoid

Example	<a href="https://w3id.org/geosrs/PZ90">geosrs:PZ90</a>
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### 13.3.4. Instance: geosrs:Airy1830

**Table 373** — geosrs:Airy1830

URI	<a href="https://w3id.org/geosrs/Airy1830">https://w3id.org/geosrs/Airy1830</a>
Type	<a href="https://w3id.org/geosrs/Ellipsoid">geosrs:Ellipsoid</a>
Definition	Airy 1830 Ellipsoid
Example	<a href="https://w3id.org/geosrs/Airy1830">geosrs:Airy1830</a>

### 13.3.5. Instance: geosrs:AiryModified1849

**Table 374** — geosrs:AiryModified1849

URI	<a href="https://w3id.org/geosrs/AiryModified1849">https://w3id.org/geosrs/AiryModified1849</a>
Type	<a href="https://w3id.org/geosrs/Ellipsoid">geosrs:Ellipsoid</a>
Definition	Airy 1849 Modified Ellipsoid
Example	<a href="https://w3id.org/geosrs/AiryModified1849">geosrs:AiryModified1849</a>

### 13.3.6. Instance: geosrs:International1924

**Table 375** — geosrs:International1924

URI	<a href="https://w3id.org/geosrs/International1924">https://w3id.org/geosrs/International1924</a>
Type	<a href="https://w3id.org/geosrs/Ellipsoid">geosrs:Ellipsoid</a>
Definition	International 1924 Ellipsoid
Example	<a href="https://w3id.org/geosrs/International1924">geosrs:International1924</a>

### 13.3.7. Instance: geosrs:AustralianNationalSpheroid

**Table 376** — geosrs:AustralianNationalSpheroid

URI	<a href="https://w3id.org/geosrs/AustralianNationalSpheroid">https://w3id.org/geosrs/AustralianNationalSpheroid</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Australian National Spheroid
Example	<a href="#">geosrs:AustralianNationalSpheroid</a>

### 13.3.8. Instance: geosrs:Everest1930

**Table 377** — geosrs:Everest1930

URI	<a href="https://w3id.org/geosrs/Everest1930">https://w3id.org/geosrs/Everest1930</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Everest 1930 Spheroid

### 13.3.9. Instance: geosrs:Clarke1866

**Table 378** — geosrs:Clarke1866

URI	<a href="https://w3id.org/geosrs/Clarke1866">https://w3id.org/geosrs/Clarke1866</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Clarke 1866 Spheroid
Example	<a href="#">geosrs:Clarke1866</a>

### 13.3.10. Instance: geosrs:Plessis1817



**Table 379** — geosrs:Plessis1817

URI	<a href="https://w3id.org/geosrs/Plessis1817">https://w3id.org/geosrs/Plessis1817</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Plessis 1817 Spheroid
Example	<a href="#">geosrs:Plessis1817</a>

### 13.3.11. Instance: geosrs:Danish1876

**Table 380** — geosrs:Danish1876

URI	<a href="https://w3id.org/geosrs/Danish1876">https://w3id.org/geosrs/Danish1876</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Danish 1876 Spheroid
Example	<a href="#">geosrs:Danish1876</a>

### 13.3.12. Instance: geosrs:Struve1860

**Table 381** — geosrs:Struve1860

URI	<a href="https://w3id.org/geosrs/Struve1860">https://w3id.org/geosrs/Struve1860</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Struve 1860 Spheroid
Example	<a href="#">geosrs:Struve1860</a>

### 13.3.13. Instance: geosrs:IAG1975

**Table 382** — geosrs:IAG1975

URI	<a href="https://w3id.org/geosrs/IAG1975">https://w3id.org/geosrs/IAG1975</a>
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Type	<a href="#">geosrs:Ellipsoid</a>
Definition	IAG 1975 Spheroid
Example	<a href="#">geosrs:IAG1975</a>

### 13.3.14. Instance: geosrs:Clarke1858

**Table 383** — geosrs:Clarke1858

URI	<a href="https://w3id.org/geosrs/Clarke1858">https://w3id.org/geosrs/Clarke1858</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Clarke 1858 Spheroid
Example	<a href="#">geosrs:Clarke1858</a>

### 13.3.15. Instance: geosrs:Clarke1880

**Table 384** — geosrs:Clarke1880

URI	<a href="https://w3id.org/geosrs/Clarke1880">https://w3id.org/geosrs/Clarke1880</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Clarke 1880 Spheroid
Example	<a href="#">geosrs:Clarke1880</a>

### 13.3.16. Instance: geosrs:Helmert1906

**Table 385** — geosrs:Helmert1906

URI	<a href="https://w3id.org/geosrs/Helmert1906">https://w3id.org/geosrs/Helmert1906</a>
Type	<a href="#">geosrs:Ellipsoid</a>

Definition	Helmert 1906 Spheroid
Example	<a href="#">geosrs:Helmert1906</a>

### 13.3.17. Instance: geosrs:CGCS2000

**Table 386** — geosrs:CGCS2000

URI	<a href="https://w3id.org/geosrs/CGCS2000">https://w3id.org/geosrs/CGCS2000</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	CGCS2000 Spheroid
Example	<a href="#">geosrs:CGCS2000</a>

### 13.3.18. Instance: geosrs:GSK-2011

**Table 387** — geosrs:GSK-2011

URI	<a href="https://w3id.org/geosrs/GSK-2011">https://w3id.org/geosrs/GSK-2011</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	GSK-2011 Spheroid

### 13.3.19. Instance: geosrs:Zach1812

**Table 388** — geosrs:Zach1812

URI	<a href="https://w3id.org/geosrs/Zach1812">https://w3id.org/geosrs/Zach1812</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Zach 1812 Spheroid
Example	<a href="#">geosrs:Zach1812</a>

### 13.3.20. Instance: geosrs:Clarke1880ARC

**Table 389** — geosrs:Clarke1880ARC

URI	<a href="https://w3id.org/geosrs/Clarke1880ARC">https://w3id.org/geosrs/Clarke1880ARC</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Clarke 1880 (Arc) Spheroid
Example	<a href="#">geosrs:Clarke1880ARC</a>

### 13.3.21. Instance: geosrs:Clarke1880IGN

**Table 390** — geosrs:Clarke1880IGN

URI	<a href="https://w3id.org/geosrs/Clarke1880IGN">https://w3id.org/geosrs/Clarke1880IGN</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Clarke 1880 (Ing) Spheroid
Example	<a href="#">geosrs:Clarke1880IGN</a>

### 13.3.22. Instance: geosrs:WGS66

**Table 391** — geosrs:WGS66

URI	<a href="https://w3id.org/geosrs/WGS66">https://w3id.org/geosrs/WGS66</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	WGS 66 Spheroid

### 13.3.23. Instance: geosrs:WGS72

**Table 392 — geosrs:WGS72**

URI	<a href="https://w3id.org/geosrs/WGS72">https://w3id.org/geosrs/WGS72</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	WGS 72 Spheroid
Example	<a href="#">geosrs:WGS72</a>

### 13.3.24. Instance: geosrs:WGS84

**Table 393 — geosrs:WGS84**

URI	<a href="https://w3id.org/geosrs/WGS84">https://w3id.org/geosrs/WGS84</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	WGS 84 Spheroid
Example	<a href="#">geosrs:WGS84</a>

### 13.3.25. Instance: geosrs:Krassowsky1940

**Table 394 — geosrs:Krassowsky1940**

URI	<a href="https://w3id.org/geosrs/Krassowsky1940">https://w3id.org/geosrs/Krassowsky1940</a>
Type	<a href="#">geosrs:Ellipsoid</a>
Definition	Krassowsky 1940 Spheroid
Example	<a href="#">geosrs:Krassowsky1940</a>

















# ANNEX A (NORMATIVE) ABSTRACT TEST SUITE

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# ANNEX A (NORMATIVE) ABSTRACT TEST SUITE

## A.0. Overview

## A.0. Overview

This Annex lists tests for the Conformance Classes defined in the main body sections of this Specification with links to their Requirements and test purpose method and type. Conformance classes may be used to signify the compatibility of a given implementation to parts of the CRS Ontology standard. They may be stated as part of a SPARQL 1.1 Service Description [SPARQLSERVDESC] .

## A.1. Conformance Class: Core

CONFORMANCE CLASS A.1: 06-CORE.ADOC	
IDENTIFIER	/conf/core
REQUIREMENTS CLASS	Requirements class 1: /req/core
CONFORMANCE TESTS	Abstract test A.1: /conf/core/Coordinate_Reference_System_Parameters Abstract test A.2: /conf/core/Coordinate_Reference_System_Types Abstract test A.3: /conf/core/Coordinate_Reference_System_Properties

### A.1.1. Coordinate Reference System Parameters

ABSTRACT TEST A.1	
IDENTIFIER	/conf/core/Coordinate_Reference_System_Parameters

## ABSTRACT TEST A.1

REQUIREMENT	Requirement 1: /req/core/Coordinate_Reference_System_Parameters
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:AreaOfUse geosrs:Extent geosrs:GeographicBoundingBox geosrs:AxesList geosrs:SingleCRSList return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:AreaOfUse geosrs:Extent geosrs:GeographicBoundingBox geosrs:AxesList geosrs:SingleCRSList

### A.1.2. Coordinate Reference System Types

## ABSTRACT TEST A.2

IDENTIFIER	/conf/core/Coordinate_Reference_System_Types
REQUIREMENT	Requirement 3: /req/core/Coordinate_Reference_System_Types
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:BoundCRS geosrs:CompoundCRS geosrs:CRS geosrs:EngineeringCRS geosrs:GeocentricCRS geosrs:GeodeticCRS geosrs:GeographicCRS geosrs:ParametricCRS geosrs:ProjectedCRS geosrs:SelenographicCRS geosrs:ReferenceSystem geosrs:SingleCRS geosrs:SpatialReferenceSystem geosrs:SpatioParametricCompoundCRS geosrs:SpatioParametricTemporalCompoundCRS geosrs:SpatioTemporalCompoundCRS geosrs:StaticCRS geosrs:TemporalCRS geosrs:VerticalCRS return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:BoundCRS geosrs:CompoundCRS geosrs:CRS geosrs:EngineeringCRS geosrs:GeocentricCRS geosrs:GeodeticCRS geosrs:GeographicCRS geosrs:ParametricCRS geosrs:ProjectedCRS geosrs:SelenographicCRS geosrs:ReferenceSystem geosrs:SingleCRS geosrs:SpatialReferenceSystem geosrs:SpatioParametricCompoundCRS geosrs:SpatioParametricTemporalCompoundCRS geosrs:SpatioTemporalCompoundCRS geosrs:StaticCRS geosrs:TemporalCRS geosrs:VerticalCRS

### A.1.3. Coordinate Reference System Properties

## ABSTRACT TEST A.3

IDENTIFIER	/conf/core/Coordinate_Reference_System_Properties
REQUIREMENT	Requirement 2: /req/core/Coordinate_Reference_System_Properties
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:baseCRS geosrs:conversion geosrs:coordinateSystem geosrs:datum geosrs:datumEnsemble geosrs:domainOfValidity geosrs:method geocrs:asProj4 geocrs:asProjJSON geocrs:asWKT geosrs:EPSGcode return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:baseCRS geosrs:conversion geosrs:coordinateSystem geosrs:datum geosrs:datumEnsemble geosrs:domainOfValidity geosrs:method geocrs:asProj4 geocrs:asProjJSON geocrs:asWKT geosrs:EPSGcode

## A.2. Conformance Class: Co

### CONFORMANCE CLASS A.2: 07-CO\_MODULE.ADOC

IDENTIFIER	/conf/co
REQUIREMENTS CLASS	Requirements class 2: /req/co
CONFORMANCE TESTS	Abstract test A.4: /conf/co/Coordinate_Operation_Methods Abstract test A.5: /conf/co/Coordinate_Operation_Parameters Abstract test A.6: /conf/co/Coordinate_Operation_Categories Abstract test A.7: /conf/co/Coordinate_Operation_Properties

### A.2.1. Coordinate Operation Methods

#### ABSTRACT TEST A.4

IDENTIFIER	/conf/co/Coordinate_Operation_Methods
REQUIREMENT	Requirement 5: /req/co/Coordinate_Operation_Methods

## ABSTRACT TEST A.4

TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:CoordinateOperation geosrs:PassThroughOperation geosrs:ConcatenatedOperation geosrs:SingleOperation geosrs:Transformation geosrs:Conversion geosrs:PointMotionOperation geosrs:OperationMethod return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:CoordinateOperation geosrs:PassThroughOperation geosrs:ConcatenatedOperation geosrs:SingleOperation geosrs:Transformation geosrs:Conversion geosrs:PointMotionOperation geosrs:OperationMethod

### A.2.2. Coordinate Operation Parameters

## ABSTRACT TEST A.5

IDENTIFIER	/conf/co/Coordinate_Operation_Parameters
REQUIREMENT	Requirement 6: /req/co/Coordinate_Operation_Parameters
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:GeneralOperationParameter geosrs:OperationParameterGroup geosrs:OperationParameter geosrs:GeneralParameterValue geosrs:ParameterValueGroup geosrs:OperationParameterValue return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:GeneralOperationParameter geosrs:OperationParameterGroup geosrs:OperationParameter geosrs:GeneralParameterValue geosrs:ParameterValueGroup geosrs:OperationParameterValue

### A.2.3. Coordinate Operation Categories

## ABSTRACT TEST A.6

IDENTIFIER	/conf/co/Coordinate_Operation_Categories
REQUIREMENT	Requirement 4: /req/co/Coordinate_Operation_Categories



## ABSTRACT TEST A.6

TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:GeographicObject geosrs:RegisterOperations geosrs:ScaleOperation geosrs:RotationOperation geosrs:IdentityOperation geosrs:ShearOperation geosrs:TranslationOperation geosrs:AffineTransformationOperation geosrs:CoordinateTransformationOperation return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:GeographicObject geosrs:RegisterOperations geosrs:ScaleOperation geosrs:RotationOperation geosrs:IdentityOperation geosrs:ShearOperation geosrs:TranslationOperation geosrs:AffineTransformationOperation geosrs:CoordinateTransformationOperation

### A.2.4. Coordinate Operation Properties

## ABSTRACT TEST A.7

IDENTIFIER	/conf/co/Coordinate_Operation_Properties
REQUIREMENT	Requirement 7: /req/co/Coordinate_Operation_Properties
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:derivingConversion geosrs:parameter geosrs:sourceCRS geosrs:targetCRS return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:derivingConversion geosrs:parameter geosrs:sourceCRS geosrs:targetCRS

## A.3. Conformance Class: Cs

## CONFORMANCE CLASS A.3: 08-CS\_MODULE.ADOC

IDENTIFIER	/conf/cs
REQUIREMENTS CLASS	Requirements class 3: /req/cs

## CONFORMANCE CLASS A.3: 08-CS\_MODULE.ADOC

CONFORMANCE TESTS	Abstract test A.8: /conf/cs/Temporal_Coordinate_Systems
	Abstract test A.9: /conf/cs/3D_Coordinate_Systems
	Abstract test A.10: /conf/cs/Coordinate_System_Types
	Abstract test A.11: /conf/cs/Celestial_Coordinate_Systems
	Abstract test A.12: /conf/cs/Coordinate_System_Components
	Abstract test A.13: /conf/cs/Coordinate_System_Properties

### A.3.1. Temporal Coordinate Systems

#### ABSTRACT TEST A.8

IDENTIFIER	/conf/cs/Temporal_Coordinate_Systems
REQUIREMENT	Requirement 13: /req/cs/Temporal_Coordinate_Systems
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:1DCoordinateSystem geosrs:DateTimeTemporalCoordinateSystem geosrs:TemporalCountCoordinateSystem geosrs:TemporalCoordinateSystem geosrs:TemporalMeasureCoordinateSystem return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:1DCoordinateSystem geosrs:DateTimeTemporalCoordinateSystem geosrs:TemporalCountCoordinateSystem geosrs:TemporalCoordinateSystem geosrs:TemporalMeasureCoordinateSystem

### A.3.2. 3D Coordinate Systems

#### ABSTRACT TEST A.9

IDENTIFIER	/conf/cs/3D_Coordinate_Systems
REQUIREMENT	Requirement 8: /req/cs/3D_Coordinate_Systems
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:3DCoordinateSystem geosrs:ConicalCoordinateSystem geosrs:CylindricalCoordinateSystem geosrs:EllipsoidalCoordinateSystem geosrs:SphericalCoordinateSystem return the correct result on a test dataset.

## ABSTRACT TEST A.9

TEST-METHOD-TYPE Capabilities

REFERENCE geosrs:3DCoordinateSystem geosrs:ConicalCoordinateSystem geosrs:CylindricalCoordinateSystem geosrs:EllipsoidalCoordinateSystem geosrs:SphericalCoordinateSystem

### A.3.3. Coordinate System Types

## ABSTRACT TEST A.10

IDENTIFIER /conf/cs/Coordinate\_System\_Types

REQUIREMENT Requirement 12: /req/cs/Coordinate\_System\_Types

TEST PURPOSE Check conformance with this requirement

TEST METHOD Verify that queries involving geosrs:CoordinateSystem geosrs:AffineCoordinateSystem geosrs:BarycentricCoordinateSystem geosrs:CartesianCoordinateSystem geosrs:CurvilinearCoordinateSystem geosrs:EngineeringCoordinateSystem geosrs:GeodeticCoordinateSystem geosrs:GeographicalCoordinateSystem geosrs:GridCoordinateSystem geosrs:HexagonalCoordinateSystem geosrs:LocalCoordinateSystem geosrs:ObliqueCoordinateSystem geosrs:OrdinalCoordinateSystem geosrs:OrthogonalCoordinateSystem geosrs:ParametricCoordinateSystem geosrs:PlanarCoordinateSystem geosrs:PolarCoordinateSystem geosrs:VerticalCoordinateSystem return the correct result on a test dataset.

TEST-METHOD-TYPE Capabilities

REFERENCE geosrs:CoordinateSystem geosrs:AffineCoordinateSystem geosrs:BarycentricCoordinateSystem geosrs:CartesianCoordinateSystem geosrs:CurvilinearCoordinateSystem geosrs:EngineeringCoordinateSystem geosrs:GeodeticCoordinateSystem geosrs:GeographicalCoordinateSystem geosrs:GridCoordinateSystem geosrs:HexagonalCoordinateSystem geosrs:LocalCoordinateSystem geosrs:ObliqueCoordinateSystem geosrs:OrdinalCoordinateSystem geosrs:OrthogonalCoordinateSystem geosrs:ParametricCoordinateSystem geosrs:PlanarCoordinateSystem geosrs:PolarCoordinateSystem geosrs:VerticalCoordinateSystem

### A.3.4. Celestial Coordinate Systems

## ABSTRACT TEST A.11

IDENTIFIER /conf/cs/Celestial\_Coordinate\_Systems

## ABSTRACT TEST A.11

REQUIREMENT	Requirement 9: /req/cs/Celestial_Coordinate_Systems
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:CelestialCoordinateSystem geosrs:EclipticCoordinateSystem geosrs:EquatorialCoordinateSystem geosrs:GalacticCoordinateSystem geosrs:HorizontalCoordinateSystem geosrs:PerifocalCoordinateSystem geosrs:SuperGalacticCS return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:CelestialCoordinateSystem geosrs:EclipticCoordinateSystem geosrs:EquatorialCoordinateSystem geosrs:GalacticCoordinateSystem geosrs:HorizontalCoordinateSystem geosrs:PerifocalCoordinateSystem geosrs:SuperGalacticCS

### A.3.5. Coordinate System Components

## ABSTRACT TEST A.12

IDENTIFIER	/conf/cs/Coordinate_System_Components
REQUIREMENT	Requirement 10: /req/cs/Coordinate_System_Components
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:CoordinateSystemAxis return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:CoordinateSystemAxis

### A.3.6. Coordinate System Properties

## ABSTRACT TEST A.13

IDENTIFIER	/conf/cs/Coordinate_System_Properties
REQUIREMENT	Requirement 11: /req/cs/Coordinate_System_Properties

## ABSTRACT TEST A.13

TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:axis geosrs:axisDirection return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:axis geosrs:axisDirection

## A.4. Conformance Class: Datum

### CONFORMANCE CLASS A.4: 09-DATUM\_MODULE.ADOC

IDENTIFIER	/conf/datum
REQUIREMENTS CLASS	Requirements class 4: /req/datum
CONFORMANCE TESTS	Abstract test A.14: /conf/datum/Datum_Types Abstract test A.15: /conf/datum/Datum_Parameters Abstract test A.16: /conf/datum/Spheroid_Types Abstract test A.17: /conf/datum/Datum_Properties Abstract test A.18: /conf/datum/Spheroid_Properties

### A.4.1. Datum Types

#### ABSTRACT TEST A.14

IDENTIFIER	/conf/datum/Datum_Types
REQUIREMENT	Requirement 16: /req/datum/Datum_Types
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:Datum geosrs:GeodeticDatum geosrs:DynamicGeodeticReferenceFrame geosrs:VerticalDatum geosrs:DynamicVerticalDatum geosrs:ParametricDatum geosrs:EngineeringDatum geosrs:TemporalDatum geosrs:DatumEnsemble return the correct result on a test dataset.

## ABSTRACT TEST A.14

TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:Datum geosrs:GeodeticDatum geosrs:DynamicGeodeticReferenceFrame geosrs:VerticalDatum geosrs:DynamicVerticalDatum geosrs:ParametricDatum geosrs:EngineeringDatum geosrs:TemporalDatum geosrs:DatumEnsemble

### A.4.2. Datum Parameters

## ABSTRACT TEST A.15

IDENTIFIER	/conf/datum/Datum_Parameters
REQUIREMENT	Requirement 14: /req/datum/Datum_Parameters
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:PrimeMeridian geosrs:DefiningParameter return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:PrimeMeridian geosrs:DefiningParameter

### A.4.3. Spheroid Types

## ABSTRACT TEST A.16

IDENTIFIER	/conf/datum/Spheroid_Types
REQUIREMENT	Requirement 18: /req/datum/Spheroid_Types
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:Ellipsoid geosrs:TriaxialEllipsoid return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:Ellipsoid geosrs:TriaxialEllipsoid

## A.4.4. Datum Properties

### ABSTRACT TEST A.17

IDENTIFIER	/conf/datum/Datum_Properties
REQUIREMENT	Requirement 15: /req/datum/Datum_Properties
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:datumDefiningParameter geosrs:ellipsoid geosrs:prime Meridian return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:datumDefiningParameter geosrs:ellipsoid geosrs:primeMeridian

## A.4.5. Spheroid Properties

### ABSTRACT TEST A.18

IDENTIFIER	/conf/datum/Spheroid_Properties
REQUIREMENT	Requirement 17: /req/datum/Spheroid_Properties
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:eccentricity geosrs:inverseFlattening geosrs:isSphere geosrs:semiMajorAxis geosrs:semiMinorAxis return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:eccentricity geosrs:inverseFlattening geosrs:isSphere geosrs:semiMajorAxis geosrs:semi MinorAxis

## A.5. Conformance Class: Srsapplication

## CONFORMANCE CLASS A.5: 10-SRSAPPLICATION\_MODULE.ADOC

IDENTIFIER	/conf/srsapplication
REQUIREMENTS CLASS	Requirements class 5: /req/srsapplication
CONFORMANCE TESTS	Abstract test A.19: /conf/srsapplication/SRS_Application_Types Abstract test A.20: /conf/srsapplication/Map_Types

### A.5.1. SRS Application Types

#### ABSTRACT TEST A.19

IDENTIFIER	/conf/srsapplication/SRS_Application_Types
REQUIREMENT	Requirement 20: /req/srsapplication/SRS_Application_Types
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:SRSApplication geosrs:SpatialReferencing geosrs:EngineeringSurvey geosrs:SatelliteSurvey geosrs:SatelliteNavigation geosrs:CoastalHydrography geosrs:OffshoreEngineering geosrs:Hydrography geosrs:Drilling geosrs:OilAndGasExploration return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:SRSApplication geosrs:SpatialReferencing geosrs:EngineeringSurvey geosrs:SatelliteSurvey geosrs:SatelliteNavigation geosrs:CoastalHydrography geosrs:OffshoreEngineering geosrs:Hydrography geosrs:Drilling geosrs:OilAndGasExploration

### A.5.2. Map Types

#### ABSTRACT TEST A.20

IDENTIFIER	/conf/srsapplication/Map_Types
REQUIREMENT	Requirement 19: /req/srsapplication/Map_Types
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:CadastralMap geosrs:NauticalChart geosrs:ThematicMap geosrs:TopographicMap geosrs:WeatherMap return the correct result on a test dataset.



## ABSTRACT TEST A.20

### TEST-METHOD-TYPE

Capabilities

### REFERENCE

geosrs:CadastralMap geosrs:NauticalChart geosrs:ThematicMap geosrs:TopographicMap geosrs:WeatherMap

## A.6. Conformance Class: Projections

### CONFORMANCE CLASS A.6: 11-PROJECTIONS\_MODULE.ADOC

#### IDENTIFIER

/conf/projections

#### REQUIREMENTS CLASS

Requirements class 6: /req/projections

#### CONFORMANCE TESTS

Abstract test A.21: /conf/projections/Lenticular\_Projections  
Abstract test A.22: /conf/projections/Conformal\_Projections  
Abstract test A.23: /conf/projections/Minimum\_Error\_Projections  
Abstract test A.24: /conf/projections/Pseudo\_Azimuthal\_Projections  
Abstract test A.25: /conf/projections/Equal\_Area\_Projections  
Abstract test A.26: /conf/projections/Pseudo\_Conical\_Projections  
Abstract test A.27: /conf/projections/Globular\_Projections  
Abstract test A.28: /conf/projections/Pseudo\_Cylindrical\_Projections  
Abstract test A.29: /conf/projections/Archaic\_Projections  
Abstract test A.30: /conf/projections/Cylindrical\_Projections  
Abstract test A.31: /conf/projections/Compromise\_Projections  
Abstract test A.32: /conf/projections/Polyhedral\_Projections  
Abstract test A.33: /conf/projections/Equidistant\_Projections  
Abstract test A.34: /conf/projections/Azimuthal\_Projections  
Abstract test A.35: /conf/projections/Conical\_Projections  
Abstract test A.36: /conf/projections/Perspective\_Projections  
Abstract test A.37: /conf/projections/Stereographic\_Projections  
Abstract test A.38: /conf/projections/Polyconic\_Projections  
Abstract test A.39: /conf/projections/Projection

### A.6.1. Lenticular Projections

## ABSTRACT TEST A.21

#### IDENTIFIER

/conf/projections/Lenticular\_Projections

## ABSTRACT TEST A.21

**REQUIREMENT** Requirement 30: /req/projections/Lenticular\_Projections

**TEST PURPOSE** Check conformance with this requirement

**TEST METHOD** Verify that queries involving geosrs:A4Projection geosrs:BriesemeisterProjection geosrs:CiricIProjection geosrs:CupolaProjection geosrs:DedistortProjection geosrs:DietrichKitadaProjection geosrs:FranculaIIProjection geosrs:FranculaIVProjection geosrs:FranculaIXProjection geosrs:FranculaVIIIProjection geosrs:FranculaVProjection geosrs:FranculaXIIIProjection geosrs:FranculaXIIProjection geosrs:FranculaXIVProjection geosrs:HamusoidalProjection geosrs:KissProjection return the correct result on a test dataset.

**TEST-METHOD-TYPE** Capabilities

**REFERENCE** geosrs:A4Projection geosrs:BriesemeisterProjection geosrs:CiricIProjection geosrs:CupolaProjection geosrs:DedistortProjection geosrs:DietrichKitadaProjection geosrs:FranculaIIProjection geosrs:FranculaIVProjection geosrs:FranculaIXProjection geosrs:FranculaVIIIProjection geosrs:FranculaVProjection geosrs:FranculaXIIIProjection geosrs:FranculaXIIProjection geosrs:FranculaXIVProjection geosrs:HamusoidalProjection geosrs:KissProjection

## A.6.2. Conformal Projections

### ABSTRACT TEST A.22

**IDENTIFIER** /conf/projections/Conformal\_Projections

**REQUIREMENT** Requirement 24: /req/projections/Conformal\_Projections

**TEST PURPOSE** Check conformance with this requirement

**TEST METHOD** Verify that queries involving geosrs:AdamsProjection geosrs:AdamsWorldInASquareIIProjection geosrs:AdamsWorldInASquareIProjection geosrs:AugustEpicycloidalProjection geosrs:CoxConformalProjection geosrs:EisenlohrProjection geosrs:GS50Projection geosrs:PeirceQuincuncialProjection geosrs:StereographicProjection return the correct result on a test dataset.

**TEST-METHOD-TYPE** Capabilities

**REFERENCE** geosrs:AdamsProjection geosrs:AdamsWorldInASquareIIProjection geosrs:AdamsWorldInASquareIProjection geosrs:AugustEpicycloidalProjection geosrs:CoxConformalProjection geosrs:EisenlohrProjection geosrs:GS50Projection geosrs:PeirceQuincuncialProjection geosrs:StereographicProjection

### A.6.3. Minimum Error Projections

ABSTRACT TEST A.23	
IDENTIFIER	/conf/projections/Minimum_Error_Projections
REQUIREMENT	Requirement 31: /req/projections/Minimum_Error_Projections
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:AiryProjection return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:AiryProjection

### A.6.4. Pseudo Azimuthal Projections

ABSTRACT TEST A.24	
IDENTIFIER	/conf/projections/Pseudo_Azimuthal_Projections
REQUIREMENT	Requirement 36: /req/projections/Pseudo_Azimuthal_Projections
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:AitoffObliqueProjection geosrs:AitoffProjection geosrs:BartholomewProjection geosrs:HammerProjection geosrs:PseudoAzimuthalProjection geosrs:Strebe1995Projection geosrs:WinkelTripelProjection return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:AitoffObliqueProjection geosrs:AitoffProjection geosrs:BartholomewProjection geosrs:HammerProjection geosrs:PseudoAzimuthalProjection geosrs:Strebe1995Projection geosrs:WinkelTripelProjection

### A.6.5. Equal Area Projections

## ABSTRACT TEST A.25

**IDENTIFIER** /conf/projections/Equal\_Area\_Projections

**REQUIREMENT** Requirement 27: /req/projections/Equal\_Area\_Projections

**TEST PURPOSE** Check conformance with this requirement

**TEST METHOD**

Verify that queries involving geosrs:AlbersEqualAreaProjection geosrs:AzimuthalEqualAreaProjection geosrs:CylindricalEqualArea geosrs:EqualAreaProjection geosrs:GallPetersProjection geosrs:HoboDyerProjection geosrs:LambertAzimuthalEqualArea geosrs:LambertCylindricalEqualAreaProjection geosrs:ObliqueCylindricalEqualAreaProjection geosrs:SlideAndDiceParallelSmallCircle geosrs:SliceAndDiceVertexGreatCircle geosrs:SmythEqualSurfaceProjection geosrs:SnyderEqualArea geosrs:ToblerWorldInASquareProjection geosrs:TransverseCylindricalEqualAreaProjection geosrs:TrystanEdwardsProjection geosrs:WiechelProjection return the correct result on a test dataset.

**TEST-METHOD-TYPE**

Capabilities

**REFERENCE**

geosrs:AlbersEqualAreaProjection geosrs:AzimuthalEqualAreaProjection geosrs:CylindricalEqualArea geosrs:EqualAreaProjection geosrs:GallPetersProjection geosrs:HoboDyerProjection geosrs:LambertAzimuthalEqualArea geosrs:LambertCylindricalEqualAreaProjection geosrs:ObliqueCylindricalEqualAreaProjection geosrs:SlideAndDiceParallelSmallCircle geosrs:SliceAndDiceVertexGreatCircle geosrs:SmythEqualSurfaceProjection geosrs:SnyderEqualArea geosrs:ToblerWorldInASquareProjection geosrs:TransverseCylindricalEqualAreaProjection geosrs:TrystanEdwardsProjection geosrs:WiechelProjection

## A.6.6. Pseudo Conical Projections

## ABSTRACT TEST A.26

**IDENTIFIER** /conf/projections/Pseudo\_Conical\_Projections

**REQUIREMENT** Requirement 37: /req/projections/Pseudo\_Conical\_Projections

**TEST PURPOSE** Check conformance with this requirement

**TEST METHOD**

Verify that queries involving geosrs:AmericanPolyconicProjection geosrs:BonneProjection geosrs:BottomleyProjection geosrs:NicolosiGlobularProjection geosrs:PseudoConicalProjection geosrs:PtolemyIIProjection geosrs:StabiusWernerIIProjection geosrs:WernerProjection return the correct result on a test dataset.

**TEST-METHOD-TYPE**

Capabilities

## ABSTRACT TEST A.26

REFERENCE	geosrs:AmericanPolyconicProjection geosrs:BonneProjection geosrs:BottomleyProjection geosrs:NicolosiGlobularProjection geosrs:PseudoConicalProjection geosrs:PtolemyIIProjection geosrs:StabiusWernerIIProjection geosrs:WernerProjection
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## A.6.7. Globular Projections

### ABSTRACT TEST A.27

IDENTIFIER	/conf/projections/Globular_Projections
REQUIREMENT	Requirement 29: /req/projections/Globular_Projections
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:ApianGlobularIProjection geosrs:BaconGlobularProjection geosrs:FournierGlobularIProjection return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:ApianGlobularIProjection geosrs:BaconGlobularProjection geosrs:FournierGlobularIProjection

## A.6.8. Pseudo Cylindrical Projections

### ABSTRACT TEST A.28

IDENTIFIER	/conf/projections/Pseudo_Cylindrical_Projections
REQUIREMENT	Requirement 38: /req/projections/Pseudo_Cylindrical_Projections
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:ApianIIProjection geosrs:AtlantisProjection geosrs:BaranyiIIProjection geosrs:BaranyiIIIProjection geosrs:BaranyiIVProjection geosrs:BoggsEumorphicProjection geosrs:BromleyProjection geosrs:CabotProjection geosrs:CollignonProjection geosrs:CrasterParabolicProjection geosrs:DeakinMinimumErrorProjection geosrs:Eckert1Projection geosrs:Eckert2Projection geosrs:Eckert3Projection geosrs:Eckert4Projection geosrs:Eckert5Projection geosrs:Eckert6Projection geosrs:EqualEarthProjection geosrs:FaheyProjection geosrs:FoucautProjection geosrs:FoucautSinusoidalProjection geosrs:FournierIIProjection geosrs:GinzburgVIIIProjection geosrs:GoodeHomolosineProjection geosrs:HEALPixProjection geosrs:HatanoAsymmetricalEqualAreaProjection geosrs:HufnagelProjection

## ABSTRACT TEST A.28

geosrs:Kavrayskiy7Projection geosrs:LoximuthalProjection geosrs:MayrProjection geosrs:McBrydeThomasFlatPolarParabolicProjection geosrs:McBrydeThomasFlatPolarQuarticProjection geosrs:McBrydeThomasFlatPolarSinusoidalProjection geosrs:McBrydeThomasIIProjection geosrs:McBrydeThomasIProjection geosrs:NaturalEarth2Projection geosrs:NaturalEarthProjection geosrs:NellHammerProjection geosrs:NellProjection geosrs:OrteliusOvalProjection geosrs:PseudoCylindricalProjection geosrs:PutninsP1Projection geosrs:PutninsP2Projection geosrs:PutninsP3Projection geosrs:PutninsP5Projection geosrs:PutninsP6Projection geosrs:QuarticAuthalicProjection geosrs:RobinsonProjection geosrs:SinusoidalProjection geosrs:TheTimesProjection geosrs:ToblerG1Projection geosrs:ToblerHyperellipticalProjection geosrs:WagnerIIIProjection geosrs:WagnerIIProjection geosrs:WagnerIProjection geosrs:WagnerIVProjection geosrs:WagnerVProjection geosrs:WagnerVProjection geosrs:WerenskioldIProjection geosrs:PutninsP3'Projection geosrs:PutninsP4'Projection geosrs:PutninsP5'Projection geosrs:PutninsP6'Projection return the correct result on a test dataset.

### TEST-METHOD-TYPE

Capabilities

### REFERENCE

geosrs:ApianIIProjection geosrs:AtlantisProjection geosrs:BaranyIIIProjection geosrs:BaranyiIIProjection geosrs:BaranyiIProjection geosrs:BaranyiIVProjection geosrs:BoggsEumorphicProjection geosrs:BromleyProjection geosrs:CabotProjection geosrs:CollignonProjection geosrs:CrasterParabolicProjection geosrs:DeakinMinimumErrorProjection geosrs:Eckert1Projection geosrs:Eckert2Projection geosrs:Eckert3Projection geosrs:Eckert4Projection geosrs:Eckert5Projection geosrs:Eckert6Projection geosrs:EqualEarthProjection geosrs:FaheyProjection geosrs:FoucautProjection geosrs:FoucautSinusoidalProjection geosrs:FournierIIProjection geosrs:GinzburgVIIIProjection geosrs:GoodeHomolosineProjection geosrs:HEALPixProjection geosrs:HatanoAsymmetricalEqualAreaProjection geosrs:HufnagelProjection geosrs:Kavrayskiy7Projection geosrs:LoximuthalProjection geosrs:MayrProjection geosrs:McBrydeThomasFlatPolarParabolicProjection geosrs:McBrydeThomasFlatPolarQuarticProjection geosrs:McBrydeThomasFlatPolarSinusoidalProjection geosrs:McBrydeThomasIIProjection geosrs:McBrydeThomasIProjection geosrs:NaturalEarth2Projection geosrs:NaturalEarthProjection geosrs:NellHammerProjection geosrs:NellProjection geosrs:OrteliusOvalProjection geosrs:PseudoCylindricalProjection geosrs:PutninsP1Projection geosrs:PutninsP2Projection geosrs:PutninsP3Projection geosrs:PutninsP5Projection geosrs:PutninsP6Projection geosrs:QuarticAuthalicProjection geosrs:RobinsonProjection geosrs:SinusoidalProjection geosrs:TheTimesProjection geosrs:ToblerG1Projection geosrs:ToblerHyperellipticalProjection geosrs:WagnerIIIProjection geosrs:WagnerIIProjection geosrs:WagnerIProjection geosrs:WagnerIVProjection geosrs:WagnerVProjection geosrs:WagnerVProjection geosrs:WerenskioldIProjection geosrs:PutninsP3'Projection geosrs:PutninsP4'Projection geosrs:PutninsP5'Projection geosrs:PutninsP6'Projection

## A.6.9. Archaic Projections

## ABSTRACT TEST A.29

IDENTIFIER	/conf/projections/Archaic_Projections
REQUIREMENT	Requirement 21: /req/projections/Archaic_Projections
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:ArchaicProjection geosrs:PtolemyIProjection return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:ArchaicProjection geosrs:PtolemyIProjection

## A.6.10. Cylindrical Projections

### ABSTRACT TEST A.30

IDENTIFIER	/conf/projections/Cylindrical_Projections
REQUIREMENT	Requirement 26: /req/projections/Cylindrical_Projections
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:ArdenCloseProjection geosrs:BSAMCylindricalProjection geosrs:BalthasartProjection geosrs:BehrmannProjection geosrs:BraunPerspectiveProjection geosrs:BraunStereographicProjection geosrs:CompactMillerProjection geosrs:CylindricalProjection geosrs:CylindricalStereographicProjection geosrs:KarchenkoShabanovaProjection geosrs:LabordeProjection geosrs:MercatorProjection geosrs:MillerProjection geosrs:PattersonCylindricalProjection geosrs:PavlovProjection geosrs:ToblerCylindricalIIIProjection geosrs:ToblerCylindricalIProjection geosrs:TransverseMercatorProjection geosrs:UrmayevIIIProjection geosrs:WebMercatorProjection return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:ArdenCloseProjection geosrs:BSAMCylindricalProjection geosrs:BalthasartProjection geosrs:BehrmannProjection geosrs:BraunPerspectiveProjection geosrs:BraunStereographicProjection geosrs:CompactMillerProjection geosrs:CylindricalProjection geosrs:CylindricalStereographicProjection geosrs:KarchenkoShabanovaProjection geosrs:LabordeProjection geosrs:MercatorProjection geosrs:MillerProjection geosrs:PattersonCylindricalProjection geosrs:PavlovProjection geosrs:ToblerCylindricalIIIProjection geosrs:ToblerCylindricalIProjection geosrs:TransverseMercatorProjection geosrs:UrmayevIIIProjection geosrs:WebMercatorProjection

## A.6.11. Compromise Projections

### ABSTRACT TEST A.31

IDENTIFIER	/conf/projections/Compromise_Projections
REQUIREMENT	Requirement 23: /req/projections/Compromise_Projections
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:ArmadilloProjection geosrs:BakerDinomicProjection geosrs:BertinProjection geosrs:ChamberlinTrimetricProjection geosrs:DenoyerSemiEllipticalProjection geosrs:FairgrieveProjection geosrs:LarriveeProjection geosrs:PetermannStarProjection geosrs:SpilhausOceanicProjection geosrs:VanDerGrintenIIIProjection geosrs:WinkelIIIProjection geosrs:WinkelProjection geosrs:WinkelSnyderProjection return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:ArmadilloProjection geosrs:BakerDinomicProjection geosrs:BertinProjection geosrs:ChamberlinTrimetricProjection geosrs:DenoyerSemiEllipticalProjection geosrs:FairgrieveProjection geosrs:LarriveeProjection geosrs:PetermannStarProjection geosrs:SpilhausOceanicProjection geosrs:VanDerGrintenIIIProjection geosrs:WinkelIIIProjection geosrs:WinkelProjection geosrs:WinkelSnyderProjection

## A.6.12. Polyhedral Projections

### ABSTRACT TEST A.32

IDENTIFIER	/conf/projections/Polyhedral_Projections
REQUIREMENT	Requirement 34: /req/projections/Polyhedral_Projections
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:AuthaGraphProjection geosrs:CahillKeyesProjection geosrs:CollignonButterflyProjection geosrs:DodecahedralProjection geosrs:DymaxionProjection geosrs:GnomonicButterflyProjection geosrs:GnomonicCubedSphereProjection geosrs:GnomonicIcosahedronProjection geosrs:GuyouProjection geosrs:IcosahedralProjection geosrs:LeeProjection geosrs:MyrahedralProjection geosrs:OctantProjection geosrs:PolyhedralProjection geosrs:QuadrilateralizedSphericalCubeProjection geosrs:WatermanButterflyProjection return the correct result on a test dataset.



## ABSTRACT TEST A.32

TEST-METHOD-TYPE Capabilities

### REFERENCE

geosrs:AuthaGraphProjection geosrs:CahillKeyesProjection geosrs:CollignonButterflyProjection geosrs:DodecahedralProjection geosrs:DymaxionProjection geosrs:GnomonicButterflyProjection geosrs:GnomonicCubedSphereProjection geosrs:GnomonicIcosahedronProjection geosrs:GuyouProjection geosrs:IcosahedralProjection geosrs:LeeProjection geosrs:MyrahedralProjection geosrs:OctantProjection geosrs:PolyhedralProjection geosrs:QuadrilateralizedSphericalCubeProjection geosrs:WatermanButterflyProjection

## A.6.13. Equidistant Projections

## ABSTRACT TEST A.33

IDENTIFIER /conf/projections/Equidistant\_Projections

REQUIREMENT Requirement 28: /req/projections/Equidistant\_Projections

TEST PURPOSE Check conformance with this requirement

### TEST METHOD

Verify that queries involving geosrs:AzimuthalEquidistantProjection geosrs:BerghausStarProjection geosrs:CassiniProjection geosrs:EquidistantConicProjection geosrs:EquidistantCylindricalProjection geosrs:EquidistantProjection geosrs:EquirectangularProjection geosrs:ObliquePlateCarreeProjection geosrs:PlateCarreeProjection geosrs:TwoPointEquidistantProjection return the correct result on a test dataset.

TEST-METHOD-TYPE Capabilities

### REFERENCE

geosrs:AzimuthalEquidistantProjection geosrs:BerghausStarProjection geosrs:CassiniProjection geosrs:EquidistantConicProjection geosrs:EquidistantCylindricalProjection geosrs:EquidistantProjection geosrs:EquirectangularProjection geosrs:ObliquePlateCarreeProjection geosrs:PlateCarreeProjection geosrs:TwoPointEquidistantProjection

## A.6.14. Azimuthal Projections

## ABSTRACT TEST A.34

IDENTIFIER /conf/projections/Azimuthal\_Projections

REQUIREMENT Requirement 22: /req/projections/Azimuthal\_Projections

## ABSTRACT TEST A.34

TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:AzimuthalProjection geosrs:BreusingGeometricProjection geosrs:BreusingHarmonicProjection geosrs:GinzburgIIProjection geosrs:GinzburgIProjection geosrs:GnomonicProjection geosrs:JamesAzimuthalProjection return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:AzimuthalProjection geosrs:BreusingGeometricProjection geosrs:BreusingHarmonicProjection geosrs:GinzburgIIProjection geosrs:GinzburgIProjection geosrs:GnomonicProjection geosrs:JamesAzimuthalProjection

## A.6.15. Conical Projections

### ABSTRACT TEST A.35

IDENTIFIER	/conf/projections/Conical_Projections
REQUIREMENT	Requirement 25: /req/projections/Conical_Projections
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:BipolarObliqueConicConformalProjection geosrs:CentralConicProjection geosrs:HerschelConformalConicProjection geosrs:Krovak geosrs:LambertConformalConicProjection geosrs:MurdochIIIProjection geosrs:MurdochIIProjection geosrs:MurdochIProjection geosrs:SchjernerIProjection geosrs:VitkovskyIProjection return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:BipolarObliqueConicConformalProjection geosrs:CentralConicProjection geosrs:HerschelConformalConicProjection geosrs:Krovak geosrs:LambertConformalConicProjection geosrs:MurdochIIIProjection geosrs:MurdochIIProjection geosrs:MurdochIProjection geosrs:SchjernerIProjection geosrs:VitkovskyIProjection

## A.6.16. Perspective Projections

## ABSTRACT TEST A.36

IDENTIFIER	/conf/projections/Perspective_Projections
REQUIREMENT	Requirement 32: /req/projections/Perspective_Projections
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:CentralCylindricalProjection geosrs:GeneralVerticalPerspectiveProjection geosrs:GilbertTwoWorldPerspectiveProjection geosrs:LaHireProjection geosrs:LorgnaProjection geosrs:LowryProjection geosrs:OrthographicProjection geosrs:PerspectiveConicProjection geosrs:PerspectiveProjection geosrs:TiltedPerspectiveProjection geosrs:VerticalPerspectiveProjection return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:CentralCylindricalProjection geosrs:GeneralVerticalPerspectiveProjection geosrs:GilbertTwoWorldPerspectiveProjection geosrs:LaHireProjection geosrs:LorgnaProjection geosrs:LowryProjection geosrs:OrthographicProjection geosrs:PerspectiveConicProjection geosrs:PerspectiveProjection geosrs:TiltedPerspectiveProjection geosrs:VerticalPerspectiveProjection

## A.6.17. Stereographic Projections

### ABSTRACT TEST A.37

IDENTIFIER	/conf/projections/Stereographic_Projections
REQUIREMENT	Requirement 39: /req/projections/Stereographic_Projections
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:GallStereographicProjection geosrs:MillerOblatedStereographicProjection geosrs:RoussilheProjection return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:GallStereographicProjection geosrs:MillerOblatedStereographicProjection geosrs:RoussilheProjection

## A.6.18. Polyconic Projections

## ABSTRACT TEST A.38

**IDENTIFIER** /conf/projections/Polyconic\_Projections

**REQUIREMENT** Requirement 33: /req/projections/Polyconic\_Projections

**TEST PURPOSE** Check conformance with this requirement

**TEST METHOD** Verify that queries involving geosrs:GinzburgIVProjection geosrs:GinzburgIXProjection geosrs:GinzburgVIPProjection geosrs:GinzburgVProjection geosrs:GottWagnerProjection geosrs:HillEucyclicProjection geosrs:LagrangeProjection geosrs:LaskowskiProjection geosrs:PolyconicProjection geosrs:RectangularPolyconicProjection geosrs:StabiusWernerIIIProjection geosrs:StabiusWernerIProjection geosrs:VanDerGrintenIIProjection geosrs:VanDerGrintenIProjection geosrs:VanDerGrintenIVProjection geosrs:WagnerIXProjection geosrs:WagnerVIIIProjection geosrs:WagnerVIIProjection return the correct result on a test dataset.

**TEST-METHOD-TYPE** Capabilities

**REFERENCE** geosrs:GinzburgIVProjection geosrs:GinzburgIXProjection geosrs:GinzburgVIPProjection geosrs:GinzburgVProjection geosrs:GottWagnerProjection geosrs:HillEucyclicProjection geosrs:LagrangeProjection geosrs:LaskowskiProjection geosrs:PolyconicProjection geosrs:RectangularPolyconicProjection geosrs:StabiusWernerIIIProjection geosrs:StabiusWernerIProjection geosrs:VanDerGrintenIIProjection geosrs:VanDerGrintenIProjection geosrs:VanDerGrintenIVProjection geosrs:WagnerIXProjection geosrs:WagnerVIIIProjection geosrs:WagnerVIIProjection

## A.6.19. Projection

### ABSTRACT TEST A.39

**IDENTIFIER** /conf/projections/Projection

**REQUIREMENT** Requirement 35: /req/projections/Projection

**TEST PURPOSE** Check conformance with this requirement

**TEST METHOD** Verify that queries involving geosrs:Projection return the correct result on a test dataset.

**TEST-METHOD-TYPE** Capabilities

**REFERENCE** geosrs:Projection

## A.7. Conformance Class: Planet

### CONFORMANCE CLASS A.7: 12-PLANET\_MODULE.ADOC

IDENTIFIER	/conf/planet
REQUIREMENTS CLASS	Requirements class 7: /req/planet
CONFORMANCE TEST	Abstract test A.40: /conf/planet/Interstellar_Body

### A.7.1. Interstellar Body

#### ABSTRACT TEST A.40

IDENTIFIER	/conf/planet/Interstellar_Body
REQUIREMENT	Requirement 40: /req/planet/Interstellar_Body
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:ArtificialSatellite geosrs:Asteroid geosrs:Comet geosrs:Dwarf Planet geosrs:InterstellarBody geosrs:Moon geosrs:NaturalSatellite geosrs:Planet geosrs:Planet Status geosrs:Plutoid geosrs:Star return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:ArtificialSatellite geosrs:Asteroid geosrs:Comet geosrs:DwarfPlanet geosrs:Interstellar Body geosrs:Moon geosrs:NaturalSatellite geosrs:Planet geosrs:PlanetStatus geosrs:Plutoid geosrs:Star

## A.8. Conformance Class: Instances

### CONFORMANCE CLASS A.8: 13-INSTANCES.ADOC

IDENTIFIER	/conf/instances
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## CONFORMANCE CLASS A.8: 13-INSTANCES.ADOC

REQUIREMENTS CLASS	Requirements class 8: /req/instances
CONFORMANCE TESTS	Abstract test A.41: /conf/instances/Coordinate_System_Axis Abstract test A.42: /conf/instances/Spheroids Abstract test A.43: /conf/instances/SRS_Literal_Types

### A.8.1. Coordinate System Axis

#### ABSTRACT TEST A.41

IDENTIFIER	/conf/instances/Coordinate_System_Axis
REQUIREMENT	Requirement 41: /req/instances/Coordinate_System_Axis
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:down geosrs:east geosrs:north geosrs:south geosrs:up geosrs:west return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:down geosrs:east geosrs:north geosrs:south geosrs:up geosrs:west

### A.8.2. Spheroids

#### ABSTRACT TEST A.42

IDENTIFIER	/conf/instances/Spheroids
REQUIREMENT	Requirement 43: /req/instances/Spheroids
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:GRS1980 geosrs:GRS67 geosrs:PZ90 geosrs:Airy1830 geosrs:AiryModified1849 geosrs:International1924 geosrs:AustralianNationalSpheroid geosrs:Everest1930 geosrs:Clarke1866 geosrs:Plessis1817 geosrs:Danish1876 geosrs:Struve1860 geosrs:IAG1975 geosrs:Clarke1858 geosrs:Clarke1880 geosrs:Helmert1906 geosrs:CGCS2000 geosrs:GSK-2011 geosrs:Zach1812 geosrs:Clarke1880ARC geosrs:Clarke1880IGN geosrs:

## ABSTRACT TEST A.42

WGS66 geosrs:WGS72 geosrs:WGS84 geosrs:Krassowsky1940 return the correct result on a test dataset.

### TEST-METHOD-TYPE

Capabilities

### REFERENCE

geosrs:GRS1980 geosrs:GRS67 geosrs:PZ90 geosrs:Airy1830 geosrs:AiryModified1849 geosrs:International1924 geosrs:AustralianNationalSpheroid geosrs:Everest1930 geosrs:Clarke1866 geosrs:Plessis1817 geosrs:Danish1876 geosrs:Struve1860 geosrs:LAG1975 geosrs:Clarke1858 geosrs:Clarke1880 geosrs:Helmert1906 geosrs:CGCS2000 geosrs:GSK-2011 geosrs:Zach1812 geosrs:Clarke1880ARC geosrs:Clarke1880IGN geosrs:WGS66 geosrs:WGS72 geosrs:WGS84 geosrs:Krassowsky1940

## A.8.3. SRS Literal Types

## ABSTRACT TEST A.43

### IDENTIFIER

/conf/instances/SRS\_Literal\_Types

### REQUIREMENT

Requirement 42: /req/instances/SRS\_Literal\_Types

### TEST PURPOSE

Check conformance with this requirement

### TEST METHOD

Verify that queries involving geosrs:proj4Literal geosrs:projJSONLiteral geosrs:wktLiteral return the correct result on a test dataset.

### TEST-METHOD-TYPE

Capabilities

### REFERENCE

geosrs:proj4Literal geosrs:projJSONLiteral geosrs:wktLiteral



# ANNEX B (INFORMATIVE) ALIGNMENTS

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# B

## ANNEX B (INFORMATIVE) ALIGNMENTS

### Overview

## Overview

The prefixes used for the ontologies mapped to in all following sections are given in the following table.

**Table B.1** — Alignment: Namespaces

ign:	<a href="http://data.ign.fr/def/ignf#">http://data.ign.fr/def/ignf#</a>
iso19111:	<a href="http://def.isotc211.org/iso19112/2019/SpatialReferencingByGeographicIdentifier#">http://def.isotc211.org/iso19112/2019/SpatialReferencingByGeographicIdentifier#</a>
geosrs:	<a href="http://www.opengis.net/ont/geosparql#">http://www.opengis.net/ont/geosparql#</a>
ifc:	<a href="https://standards.buildingsmart.org/IFC/DEV/IFC4/ADD2_TC1/OWL/">https://standards.buildingsmart.org/IFC/DEV/IFC4/ADD2_TC1/OWL/</a>
owl:	<a href="http://www.w3.org/2002/07/owl#">http://www.w3.org/2002/07/owl#</a>
prov:	<a href="http://www.w3.org/ns/prov#">http://www.w3.org/ns/prov#</a>
rdf:	<a href="http://www.w3.org/1999/02/22-rdf-syntax-ns#">http://www.w3.org/1999/02/22-rdf-syntax-ns#</a>
rdfs:	<a href="http://www.w3.org/2000/01/rdf-schema#">http://www.w3.org/2000/01/rdf-schema#</a>

## B.1. IGN Ontology

**Table B.2 – Alignment: IGN Ontology**

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:CoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CoordinateSystem</a>	-
<a href="#">geosrs:Datum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Datum</a>	-
<a href="#">geosrs:Ellipsoid</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Ellipsoid</a>	-
<a href="#">geosrs:Conversion</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Conversion</a>	-
<a href="#">geosrs:CoordinateOperation</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CoordinateOperation</a>	-
<a href="#">geosrs:OperationMethod</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:OperationMethod</a>	-
<a href="#">geosrs:OperationParameter</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:OperationParameter</a>	-
<a href="#">geosrs:OperationParameterValue</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:OperationParameterValue</a>	-
<a href="#">geosrs:SingleOperation</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:SingleOperation</a>	-
<a href="#">geosrs:Transformation</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Transformation</a>	-
<a href="#">geosrs:CartesianCoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CartesianCS</a>	-
<a href="#">geosrs:CoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CoordinateSystem</a>	-
<a href="#">geosrs:CoordinateSystemAxis</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CoordinateSystemAxis</a>	-
<a href="#">geosrs:EllipsoidalCoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:EllipsoidalCS</a>	-
<a href="#">geosrs:VerticalCoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:VerticalCS</a>	-
<a href="#">geosrs:Datum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Datum</a>	-
<a href="#">geosrs:Ellipsoid</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Ellipsoid</a>	-
<a href="#">geosrs:GeodeticDatum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:GeodeticDatum</a>	-
<a href="#">geosrs:PrimeMeridian</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:PrimeMeridian</a>	-
<a href="#">geosrs:VerticalDatum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:VerticalDatum</a>	-
<a href="#">geosrs:AxesList</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:AxesList</a>	-

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:CRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CRS</a>	-
<a href="#">geosrs:CompoundCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CompoundCRS</a>	-
<a href="#">geosrs:Extent</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Extent</a>	-
<a href="#">geosrs:GeodeticCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:GeodeticCRS</a>	-
<a href="#">geosrs:GeographicBoundingBox</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:GeographicBoundingBox</a>	-
<a href="#">geosrs:ProjectedCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:ProjectedCRS</a>	-
<a href="#">geosrs:SingleCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:SingleCRS</a>	-
<a href="#">geosrs:SingleCRSList</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:SingleCRSList</a>	-
<a href="#">geosrs:VerticalCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:VerticalCRS</a>	-

## B.2. ISO19111 Ontology

**Table B.3** – Alignment: ISO19111 Ontology

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:CoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:CoordinateSystem</a>	-
<a href="#">geosrs:Datum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:Datum</a>	-
<a href="#">geosrs:Ellipsoid</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:Ellipsoid</a>	-
<a href="#">geosrs:CRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:CRS</a>	-
<a href="#">geosrs:CompoundCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:CompoundCRS</a>	-
<a href="#">geosrs:EngineeringCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:EngineeringCRS</a>	-
<a href="#">geosrs:GeodeticCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:GeodeticCRS</a>	-

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:GeographicCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:GeographicCRS</a>	-
<a href="#">geosrs:ParametricCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:ParametricCRS</a>	-
<a href="#">geosrs:ProjectedCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:ProjectedCRS</a>	-
<a href="#">geosrs:SingleCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:SingleCRS</a>	-
<a href="#">geosrs:TemporalCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:TemporalCRS</a>	-
<a href="#">geosrs:VerticalCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:VerticalCRS</a>	-

## B.3. IFC Ontology

**Table B.4** — Alignment: IFC Ontology

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:AxisDirection</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifc:IfcDirection</a>	-
<a href="#">geosrs:CRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifc:IfcCoordinateReferenceSystem</a>	-
<a href="#">geosrs:CoordinateOperation</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifc:IfcCoordinateOperation</a>	-
<a href="#">geosrs:ProjectedCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifc:IfcProjectedCRS</a>	-
<a href="#">geosrs:axis</a>	<a href="#">owl:equivalentProperty</a>	<a href="#">ifc:axis_IfcAxis1Placement</a>	-
<a href="#">geosrs:sourceCRS</a>	<a href="#">owl:equivalentProperty</a>	<a href="#">ifc:sourceCRS</a>	-
<a href="#">geosrs:targetCRS</a>	<a href="#">owl:equivalentProperty</a>	<a href="#">ifc:targetCRS</a>	-

## B.4. IGN Ontology

**Table B.5 – Alignment: IGN Ontology**

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:CoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CoordinateSystem</a>	-
<a href="#">geosrs:Datum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Datum</a>	-
<a href="#">geosrs:Ellipsoid</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Ellipsoid</a>	-
<a href="#">geosrs:Conversion</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Conversion</a>	-
<a href="#">geosrs:CoordinateOperation</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CoordinateOperation</a>	-
<a href="#">geosrs:OperationMethod</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:OperationMethod</a>	-
<a href="#">geosrs:OperationParameter</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:OperationParameter</a>	-
<a href="#">geosrs:OperationParameterValue</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:OperationParameterValue</a>	-
<a href="#">geosrs:SingleOperation</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:SingleOperation</a>	-
<a href="#">geosrs:Transformation</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Transformation</a>	-
<a href="#">geosrs:CartesianCoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CartesianCS</a>	-
<a href="#">geosrs:CoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CoordinateSystem</a>	-
<a href="#">geosrs:CoordinateSystemAxis</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CoordinateSystemAxis</a>	-
<a href="#">geosrs:EllipsoidalCoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:EllipsoidalCS</a>	-
<a href="#">geosrs:VerticalCoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:VerticalCS</a>	-
<a href="#">geosrs:Datum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Datum</a>	-
<a href="#">geosrs:Ellipsoid</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Ellipsoid</a>	-
<a href="#">geosrs:GeodeticDatum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:GeodeticDatum</a>	-
<a href="#">geosrs:PrimeMeridian</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:PrimeMeridian</a>	-
<a href="#">geosrs:VerticalDatum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:VerticalDatum</a>	-
<a href="#">geosrs:AxesList</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:AxesList</a>	-

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:CRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CRS</a>	-
<a href="#">geosrs:CompoundCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CompoundCRS</a>	-
<a href="#">geosrs:Extent</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Extent</a>	-
<a href="#">geosrs:GeodeticCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:GeodeticCRS</a>	-
<a href="#">geosrs:GeographicBoundingBox</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:GeographicBoundingBox</a>	-
<a href="#">geosrs:ProjectedCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:ProjectedCRS</a>	-
<a href="#">geosrs:SingleCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:SingleCRS</a>	-
<a href="#">geosrs:SingleCRSList</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:SingleCRSList</a>	-
<a href="#">geosrs:VerticalCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:VerticalCRS</a>	-

## B.5. ISO19111 Ontology

**Table B.6** – Alignment: ISO19111 Ontology

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:CoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:CoordinateSystem</a>	-
<a href="#">geosrs:Datum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:Datum</a>	-
<a href="#">geosrs:Ellipsoid</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:Ellipsoid</a>	-
<a href="#">geosrs:CRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:CRS</a>	-
<a href="#">geosrs:CompoundCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:CompoundCRS</a>	-
<a href="#">geosrs:EngineeringCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:EngineeringCRS</a>	-
<a href="#">geosrs:GeodeticCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:GeodeticCRS</a>	-

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:GeographicCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:GeographicCRS</a>	-
<a href="#">geosrs:ParametricCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:ParametricCRS</a>	-
<a href="#">geosrs:ProjectedCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:ProjectedCRS</a>	-
<a href="#">geosrs:SingleCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:SingleCRS</a>	-
<a href="#">geosrs:TemporalCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:TemporalCRS</a>	-
<a href="#">geosrs:VerticalCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:VerticalCRS</a>	-

## B.6. IFC Ontology

**Table B.7** – Alignment: IFC Ontology

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:AxisDirection</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifc:IfcDirection</a>	-
<a href="#">geosrs:CRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifc:IfcCoordinateReferenceSystem</a>	-
<a href="#">geosrs:CoordinateOperation</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifc:IfcCoordinateOperation</a>	-
<a href="#">geosrs:ProjectedCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifc:IfcProjectedCRS</a>	-
<a href="#">geosrs:axis</a>	<a href="#">owl:equivalentProperty</a>	<a href="#">ifc:axis_IfcAxis1Placement</a>	-
<a href="#">geosrs:sourceCRS</a>	<a href="#">owl:equivalentProperty</a>	<a href="#">ifc:sourceCRS</a>	-
<a href="#">geosrs:targetCRS</a>	<a href="#">owl:equivalentProperty</a>	<a href="#">ifc:targetCRS</a>	-

## B.7. IGN Ontology

**Table B.8 – Alignment: IGN Ontology**

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:CoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CoordinateSystem</a>	-
<a href="#">geosrs:Datum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Datum</a>	-
<a href="#">geosrs:Ellipsoid</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Ellipsoid</a>	-
<a href="#">geosrs:Conversion</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Conversion</a>	-
<a href="#">geosrs:CoordinateOperation</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CoordinateOperation</a>	-
<a href="#">geosrs:OperationMethod</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:OperationMethod</a>	-
<a href="#">geosrs:OperationParameter</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:OperationParameter</a>	-
<a href="#">geosrs:OperationParameterValue</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:OperationParameterValue</a>	-
<a href="#">geosrs:SingleOperation</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:SingleOperation</a>	-
<a href="#">geosrs:Transformation</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Transformation</a>	-
<a href="#">geosrs:CartesianCoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CartesianCS</a>	-
<a href="#">geosrs:CoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CoordinateSystem</a>	-
<a href="#">geosrs:CoordinateSystemAxis</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CoordinateSystemAxis</a>	-
<a href="#">geosrs:EllipsoidalCoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:EllipsoidalCS</a>	-
<a href="#">geosrs:VerticalCoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:VerticalCS</a>	-
<a href="#">geosrs:Datum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Datum</a>	-
<a href="#">geosrs:Ellipsoid</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Ellipsoid</a>	-
<a href="#">geosrs:GeodeticDatum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:GeodeticDatum</a>	-
<a href="#">geosrs:PrimeMeridian</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:PrimeMeridian</a>	-
<a href="#">geosrs:VerticalDatum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:VerticalDatum</a>	-
<a href="#">geosrs:AxesList</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:AxesList</a>	-



FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:CRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CRS</a>	-
<a href="#">geosrs:CompoundCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CompoundCRS</a>	-
<a href="#">geosrs:Extent</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Extent</a>	-
<a href="#">geosrs:GeodeticCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:GeodeticCRS</a>	-
<a href="#">geosrs:GeographicBoundingBox</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:GeographicBoundingBox</a>	-
<a href="#">geosrs:ProjectedCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:ProjectedCRS</a>	-
<a href="#">geosrs:SingleCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:SingleCRS</a>	-
<a href="#">geosrs:SingleCRSList</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:SingleCRSList</a>	-
<a href="#">geosrs:VerticalCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:VerticalCRS</a>	-

## B.8. ISO19111 Ontology

**Table B.9** – Alignment: ISO19111 Ontology

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:CoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:CoordinateSystem</a>	-
<a href="#">geosrs:Datum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:Datum</a>	-
<a href="#">geosrs:Ellipsoid</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:Ellipsoid</a>	-
<a href="#">geosrs:CRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:CRS</a>	-
<a href="#">geosrs:CompoundCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:CompoundCRS</a>	-
<a href="#">geosrs:EngineeringCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:EngineeringCRS</a>	-
<a href="#">geosrs:GeodeticCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:GeodeticCRS</a>	-

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:GeographicCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:GeographicCRS</a>	-
<a href="#">geosrs:ParametricCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:ParametricCRS</a>	-
<a href="#">geosrs:ProjectedCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:ProjectedCRS</a>	-
<a href="#">geosrs:SingleCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:SingleCRS</a>	-
<a href="#">geosrs:TemporalCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:TemporalCRS</a>	-
<a href="#">geosrs:VerticalCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:VerticalCRS</a>	-

## B.9. IFC Ontology

Table B.10 – Alignment: IFC Ontology

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:AxisDirection</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifc:IfcDirection</a>	-
<a href="#">geosrs:CRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifc:IfcCoordinateReferenceSystem</a>	-
<a href="#">geosrs:CoordinateOperation</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifc:IfcCoordinateOperation</a>	-
<a href="#">geosrs:ProjectedCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifc:IfcProjectedCRS</a>	-
<a href="#">geosrs:axis</a>	<a href="#">owl:equivalentProperty</a>	<a href="#">ifc:axis_IfcAxis1Placement</a>	-
<a href="#">geosrs:sourceCRS</a>	<a href="#">owl:equivalentProperty</a>	<a href="#">ifc:sourceCRS</a>	-
<a href="#">geosrs:targetCRS</a>	<a href="#">owl:equivalentProperty</a>	<a href="#">ifc:targetCRS</a>	-

## B.10. IGN Ontology

**Table B.11** — Alignment: IGN Ontology

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:CoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CoordinateSystem</a>	-
<a href="#">geosrs:Datum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Datum</a>	-
<a href="#">geosrs:Ellipsoid</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Ellipsoid</a>	-
<a href="#">geosrs:Conversion</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Conversion</a>	-
<a href="#">geosrs:CoordinateOperation</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CoordinateOperation</a>	-
<a href="#">geosrs:OperationMethod</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:OperationMethod</a>	-
<a href="#">geosrs:OperationParameter</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:OperationParameter</a>	-
<a href="#">geosrs:OperationParameterValue</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:OperationParameterValue</a>	-
<a href="#">geosrs:SingleOperation</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:SingleOperation</a>	-
<a href="#">geosrs:Transformation</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Transformation</a>	-
<a href="#">geosrs:CartesianCoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CartesianCS</a>	-
<a href="#">geosrs:CoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CoordinateSystem</a>	-
<a href="#">geosrs:CoordinateSystemAxis</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CoordinateSystemAxis</a>	-
<a href="#">geosrs:EllipsoidalCoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:EllipsoidalCS</a>	-
<a href="#">geosrs:VerticalCoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:VerticalCS</a>	-
<a href="#">geosrs:Datum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Datum</a>	-
<a href="#">geosrs:Ellipsoid</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Ellipsoid</a>	-
<a href="#">geosrs:GeodeticDatum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:GeodeticDatum</a>	-
<a href="#">geosrs:PrimeMeridian</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:PrimeMeridian</a>	-
<a href="#">geosrs:VerticalDatum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:VerticalDatum</a>	-
<a href="#">geosrs:AxesList</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:AxesList</a>	-

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:CRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CRS</a>	-
<a href="#">geosrs:CompoundCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:CompoundCRS</a>	-
<a href="#">geosrs:Extent</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:Extent</a>	-
<a href="#">geosrs:GeodeticCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:GeodeticCRS</a>	-
<a href="#">geosrs:GeographicBoundingBox</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:GeographicBoundingBox</a>	-
<a href="#">geosrs:ProjectedCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:ProjectedCRS</a>	-
<a href="#">geosrs:SingleCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:SingleCRS</a>	-
<a href="#">geosrs:SingleCRSList</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:SingleCRSList</a>	-
<a href="#">geosrs:VerticalCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ign:VerticalCRS</a>	-

## B.11. ISO19111 Ontology

**Table B.12** – Alignment: ISO19111 Ontology

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:CoordinateSystem</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:CoordinateSystem</a>	-
<a href="#">geosrs:Datum</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:Datum</a>	-
<a href="#">geosrs:Ellipsoid</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:Ellipsoid</a>	-
<a href="#">geosrs:CRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:CRS</a>	-
<a href="#">geosrs:CompoundCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:CompoundCRS</a>	-
<a href="#">geosrs:EngineeringCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:EngineeringCRS</a>	-
<a href="#">geosrs:GeodeticCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:GeodeticCRS</a>	-

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:GeographicCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:GeographicCRS</a>	-
<a href="#">geosrs:ParametricCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:ParametricCRS</a>	-
<a href="#">geosrs:ProjectedCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:ProjectedCRS</a>	-
<a href="#">geosrs:SingleCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:SingleCRS</a>	-
<a href="#">geosrs:TemporalCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:TemporalCRS</a>	-
<a href="#">geosrs:VerticalCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">iso19111:VerticalCRS</a>	-

## B.12. IFC Ontology

**Table B.13** — Alignment: IFC Ontology

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:AxisDirection</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifc:IfcDirection</a>	-
<a href="#">geosrs:CRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifc:IfcCoordinateReferenceSystem</a>	-
<a href="#">geosrs:CoordinateOperation</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifc:IfcCoordinateOperation</a>	-
<a href="#">geosrs:ProjectedCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifc:IfcProjectedCRS</a>	-
<a href="#">geosrs:axis</a>	<a href="#">owl:equivalentProperty</a>	<a href="#">ifc:axis_IfcAxis1Placement</a>	-
<a href="#">geosrs:sourceCRS</a>	<a href="#">owl:equivalentProperty</a>	<a href="#">ifc:sourceCRS</a>	-
<a href="#">geosrs:targetCRS</a>	<a href="#">owl:equivalentProperty</a>	<a href="#">ifc:targetCRS</a>	-



# ANNEX C (INFORMATIVE) SHACL SHAPES

---



# ANNEX C

## (INFORMATIVE)

### SHACL SHAPES

This section introduces SHACL shapes which can be used to verify graphs encoded using the vocabulary defined in this specification.

Overview

## Overview

SHACL shapes in this specification are subdivided by the same module designations as used previously. In order to verify a graph a single validation file of SHACL shapes is provided alongside this specification.

### C.1. SHACL Shapes: Core

Table C.1 – Core

LABEL	TARGETNODE	PROPERTY	CLASS	MINCOUNT	MAXCOUNT	COMMENT
Shape S1	geosrs:CRS	geosrs:coordinateSystem	geosrs:CoordinateSystem	1	1	A coordinate reference system should have exactly one coordinate system
Shape S2	geosrs:CRS	geosrs:domainOfValidity	geosrs:AreaOfUse	1	-	A coordinate reference system should have at least one area of use

LABEL	TARGETNODE	PROPERTY	CLASS	MINCOUNT	MAXCOUNT	COMMENT
Shape S3	geosrs:CRS	geosrs:datum	geosrs:Datum	1	1	A coordinate reference system should have exactly one datum
Shape S4	geosrs:CRS	geosrs:datum Ensemble	geosrs:DatumEnsemble	1	1	A coordinate reference system may have exactly one datum ensemble
Shape S5	geosrs:CompoundCRS	geosrs:includes SRS	geosrs:SingleCRS	1	-	A compound coordinate reference system should consist of at least one single coordinate reference system
Shape S6	geosrs:GeodeticCRS	geosrs:coordinate System	geosrs:GeodeticCoordinate System	1	1	A geodetic coordinate reference system should have exactly one geodetic coordinate system
Shape S7	geosrs:GeographicCRS	geosrs:datum	geosrs:GeodeticDatum	1	1	A geographic coordinate reference system should have exactly one geodetic datum
Shape S8	geosrs:GeographicCRS	geosrs:coordinate System	geosrs:EllipsoidalCoordinate System	1	1	A geographic coordinate reference



LABEL	TARGETNODE	PROPERTY	CLASS	MINCOUNT	MAXCOUNT	COMMENT
						system should have exactly one ellipsoidal coordinate system
Shape S9	geosrs:ParametricCRS	geosrs:datum	geosrs:ParametricDatum	1	1	A parametric coordinate reference system should have exactly one parametric datum
Shape S10	geosrs:ProjectedCRS	geosrs:conversion	geosrs:Conversion	1	-	A projected coordinate reference system should have at least one conversion
Shape S11	geosrs:Single CRS	geosrs:coordinate System	geosrs:CoordinateSystem	1	1	A single coordinate reference system should have exactly one coordinate system
Shape S12	geosrs:Single CRS	geosrs:datum	geosrs:Datum	1	1	A single coordinate reference system should have exactly one datum
Shape S13	geosrs:TemporalCRS	geosrs:datum	geosrs:TemporalDatum	1	1	A projected coordinate reference system should have exactly one temporal datum

## C.2. SHACL Shapes: Datum

Table C.2 – Datum

LABEL	TARGETNODE	PROPERTY	CLASS	MINCOUNT	MAXCOUNT	COMMENT
Shape S1	geosrs:ParametricDatum	geosrs:definingParameter	geosrs:DefiningParameter	1	-	A parametric datum should have at least one defining parameter

## C.3. SHACL Shapes: Cs

Table C.3 – Cs

LABEL	TARGETNODE	PROPERTY	CLASS	MINCOUNT	MAXCOUNT	COMMENT
Shape S1	geosrs:3DCoordinateSystem	geosrs:axis	geosrs:CoordinateSystemAxis	3	-	A 3D coordinate system should have at least three axis
Shape S2	geosrs:ConicalCoordinateSystem	geosrs:axis	geosrs:CoordinateSystemAxis	3	-	A conical coordinate system should have at least three axis
Shape S3	geosrs:CoordinateSystem	geosrs:axis	geosrs:CoordinateSystemAxis	1	-	A coordinate system

LABEL	TARGETNODE	PROPERTY	CLASS	MINCOUNT	MAXCOUNT	COM
						should have at least one axis
Shape S4	geosrs:CoordinateSystemAxis	geosrs:axis Direction	geosrs:AxisDirection	1	1	A coordinate system axis should have exactly one axis direction
Shape S5	geosrs:CylindricalCoordinateSystem	geosrs:axis	geosrs:CoordinateSystemAxis	3	-	A cylindrical coordinate system should have at least three axis
Shape S6	geosrs:DateTimeTemporalCoordinateSystem	geosrs:axis	geosrs:CoordinateSystemAxis	1	1	A date time temporal coordinate system should have exactly one axis
Shape S7	geosrs:PlanarCoordinateSystem	geosrs:axis	geosrs:CoordinateSystemAxis	2	-	A planar coordinate system should have at least

LABEL	TARGETNODE	PROPERTY	CLASS	MINCOUNT	MAXCOUNT	COM
						two axis
Shape S8	geosrs:TemporalCoordinateSystem	geosrs:axis	geosrs:CoordinateSystemAxis	1	1	A temporal coordinate system should have exactly one axis
Shape S9	geosrs:TemporalCountCoordinateSystem	geosrs:axis	geosrs:CoordinateSystemAxis	1	1	A temporal count coordinate system should have exactly one axis
Shape S10	geosrs:TemporalMeasureCoordinateSystem	geosrs:axis	geosrs:CoordinateSystemAxis	1	1	A temporal measure coordinate system should have exactly one axis



# ANNEX D (INFORMATIVE) APPLICATION EXAMPLES

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## ANNEX D (INFORMATIVE) APPLICATION EXAMPLES

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Overview

### Overview

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#### D.1. Minimum Example

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#### D.2. Elaborate Example

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# ANNEX E (INFORMATIVE) JSON-LD CONTEXT

---

# E

## ANNEX E (INFORMATIVE) JSON-LD CONTEXT

---

We provide JSON-LD contexts to be compatible with other JSON-based formats which provide coordinate reference system data.

Overview

### Overview

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#### E.1. Compatibility to PROJJSON

---

PROJJSON is an established format to share geospatial data which has emerge from the PROJ library and encodes the WKT encoding of coordiante references systems. By adding a JSON-LD context to the PROJJSON standard we achieve an immediate compatibility with an established standard simply by extending it by one simple statement.

```
{
  "@context": "https://opengeospatial.github.io/ontology-crs/context/geosrs-
context.json",
  "$schema": "https://proj.org/schemas/v0.7/projjson.schema.json",
  ...
}
```

Listing E.1

We provide examples of application of this JSON-LD context with the distribution of this standard.

#### E.2. Compatibility to OGCJSON

---

The OGC CRS working group is aiming towards the creation of their own JSON format for CRS. The JSON-LD context we provide aims to be compatible with both PROJJSON and OGCJSON.





# ANNEX F (INFORMATIVE) REVISION HISTORY

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## ANNEX F (INFORMATIVE) REVISION HISTORY

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DATE	RELEASE	AUTHOR	PRIMARY CLAUSES MODIFIED	DESCRIPTION
2016-04-28	0.1	G. Editor	all	initial version



# BIBLIOGRAPHY





## BIBLIOGRAPHY

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**NOTE:** The TC has approved Springer LNCS as the official document citation type. Springer LNCS is widely used in technical and computer science journals and other publications. For citations in the text please use square brackets and consecutive numbers: [1], [2], [3]. Actual References: [n] Journal: Author Surname, A.: Title. Publication Title. Volume number, Issue number, Pages Used (Year Published)

- [1] ISO: ISO 19142, *Geographic information – Web Feature Service*. International Organization for Standardization, Geneva <https://www.iso.org/standard/42136.html>.
- [2] W3C: **Data Catalog Vocabulary**, W3C Recommendation 16 January 2014, <https://www.w3.org/TR/vocab-dcat/>
- [3] IANA: **Link Relation Types**, <https://www.iana.org/assignments/link-relations/link-relations.xml>
- [4] W3C/OGC: **Spatial Data on the Web Best Practices**, W3C Working Group Note 28 September 2017, <https://www.w3.org/TR/sdw-bp/>
- [5] W3C: **Data on the Web Best Practices**, W3C Recommendation 31 January 2017, <https://www.w3.org/TR/dwbp/>
- [6] Ben-Kiki, O., Evans, C., Ingy döt Net: **YAML Ain't Markup Language**, <https://yaml.org/>
- [7] OGC: **Web Feature Service 2.0**, <http://docs.openeospatial.org/is/09-025r2/09-025r2.html>
- [8] Berners-Lee, T., Fielding, R., Masinter, L.: **IETF RFC 3986 – Uniform Resource Identifier (URI): Generic Syntax**, <http://tools.ietf.org/rfc/rfc3986.txt>
- [9] Car NJ, Homburg T: GeoSPARQL 1.1: Motivations, Details and Applications of the Decadal Update to the Most Important Geospatial LOD Standard. *ISPRS International Journal of Geo-Information* vol. 11 no. 2, p. 117 (2022).