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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

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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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## IV

## SECURITY CONSIDERATIONS

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No security considerations have been made for this Standard.

## V

## SUBMITTERS

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## VI

## SOURCE OF THE CONTENT FOR THIS OGC DOCUMENT

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## VII

## VALIDITY OF CONTENT

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## VIII

## FUTURE WORK

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**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

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## 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

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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. The lines create a network of triangles and other geometric shapes across the page.

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

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term used for exemplary purposes

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

Example      Here’s an example of an example term.

[SOURCE: ]



5

# CONVENTIONS

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**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

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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

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<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.

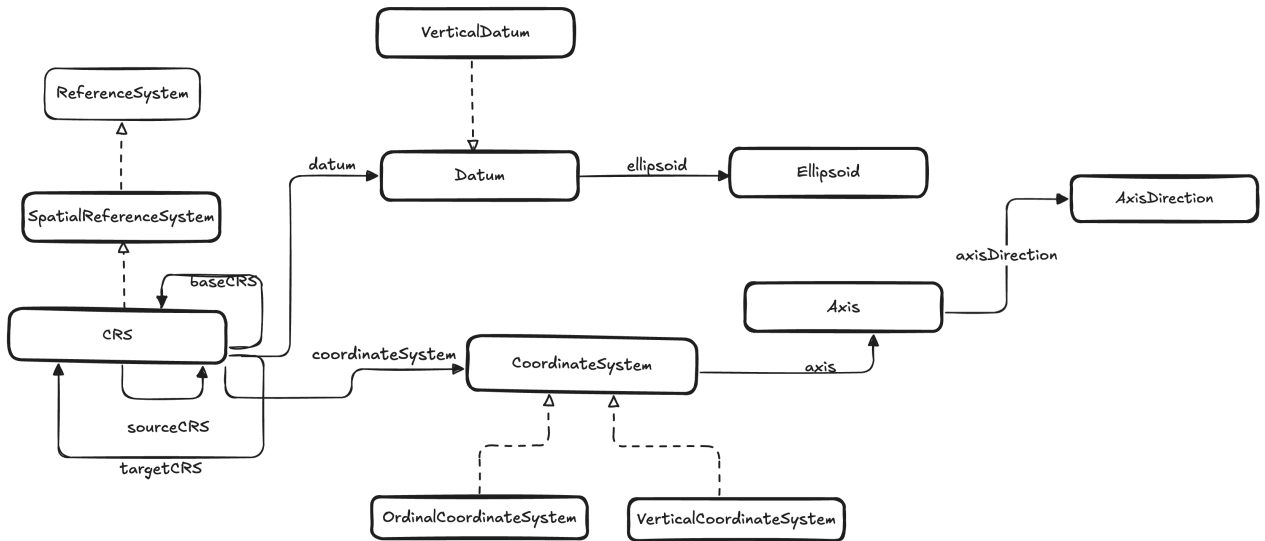


Figure 1

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/06-core.adoc
TARGET TYPE	Implementation Specification
REQUIREMENT	/req/Coordinate_Reference_System_Parameters
	/req/Coordinate_Reference_System_Types
	/req/Coordinate_Reference_System_Properties



# 6.1. Coordinate Reference System Parameters

Requirement 1: Coordinate Reference System Parameters	
IDENTIFIER	/req/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/Coordinate_Reference_System_Properties
STATEMENT	Implementations shall allow the RDFS classes 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: geocrs:asProj4

Table 6 — geocrs:asProj4

URI	geocrs:asProj4
Type	<a href="#">owl:DatatypeProperty</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>

### 6.2.2. Property: geocrs:asProjJSON

**Table 7** — 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>

### 6.2.3. Property: geocrs:asWKT

**Table 8** — 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>

## 6.3. Coordinate Reference System Types

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## REQUIREMENT 3: COORDINATE REFERENCE SYSTEM TYPES

**IDENTIFIER** /req/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.

### 6.3.1. Class: geosrs:BoundCRS

**Table 9** — geosrs:BoundCRS

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

### 6.3.2. Class: geosrs:CompoundCRS

**Table 10** — 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="#">CompoundCRS</a>
Example	<a href="#">geosrs:CompoundCRS</a>

### 6.3.3. Class: geosrs:CRS

**Table 11** — 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	<u><a href="#">CRS</a></u>

### 6.3.4. Class: geosrs:EngineeringCRS

**Table 12** — geosrs:EngineeringCRS

URI	<u><a href="https://w3id.org/geosrs/srs/EngineeringCRS">https://w3id.org/geosrs/srs/EngineeringCRS</a></u>
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	<u><a href="#">EngineeringCRS</a></u>

### 6.3.5. Class: geosrs:GeocentricCRS

**Table 13** — geosrs:GeocentricCRS

URI	<u><a href="https://w3id.org/geosrs/srs/GeocentricCRS">https://w3id.org/geosrs/srs/GeocentricCRS</a></u>
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	<u><a href="#">GeocentricCRS</a></u>
Example	<u><a href="#">geosrs:GeocentricCRS</a></u>

### 6.3.6. Class: geosrs:GeodeticCRS

**Table 14** — 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="#">GeodeticCRS</a>

### 6.3.7. Class: geosrs:GeographicCRS

**Table 15** — 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="#">GeographicCRS</a>
Example	<a href="#">geosrs:GeographicCRS</a>

### 6.3.8. Class: geosrs:ParametricCRS

**Table 16** — 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="#">ParametricCRS</a>

### 6.3.9. Class: geosrs:ProjectedCRS

**Table 17** — 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="#">ProjectedCRS</a>
Example	<a href="#">geosrs:ProjectedCRS</a>

### 6.3.10. Class: geosrs:SelenographicCRS

**Table 18** — 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="#">SelenographicCRS</a>

### 6.3.11. Class: geosrs:ReferenceSystem

**Table 19** — 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 20** — 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="#">SingleCRS</a>

### 6.3.13. Class: geosrs:SpatialReferenceSystem

**Table 21** — 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="#">SpatialReferenceSystem</a>

### 6.3.14. Class: geosrs:SpatioParametricCompoundCRS

**Table 22** — 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="#">SpatioParametricCompoundCRS</a>

### 6.3.15. Class: geosrs:SpatioParametricTemporalCompoundCRS

**Table 23** — 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="#">SpatioParametricTemporalCompoundCRS</a>

### 6.3.16. Class: geosrs:SpatioTemporalCompoundCRS

**Table 24** — 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="#">SpatioTemporalCompoundCRS</a>

### 6.3.17. Class: geosrs:StaticCRS

**Table 25** — 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="#">StaticCRS</a>

### 6.3.18. Class: geosrs:TemporalCRS

**Table 26** — 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="#">TemporalCRS</a>

## 6.3.19. Class: geosrs:VerticalCRS

**Table 27** — 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="#">VerticalCRS</a>
Example	<a href="#">geosrs:VerticalCRS</a>



7

# COORDINATE OPERATION MODULE

---

## 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\_EXTENSION.ADOC EXTENSION

IDENTIFIER	<code>/req/07-co_extension.adoc</code>
TARGET TYPE	Implementation Specification
REQUIREMENT	<code>/req/Coordinate_Operation_Methods</code>
	<code>/req/Coordinate_Operation_Parameters</code>
	<code>/req/Coordinate_Operation_Categories</code>
	<code>/req/Coordinate_Operation_Properties</code>

## 7.1. Coordinate Operation Categories

### REQUIREMENT 4: COORDINATE OPERATION CATEGORIES

IDENTIFIER	<code>/req/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 28 — `geosrs:GeographicObject`

URI	<a href="https://w3id.org/geosrs/co/GeographicObject">https://w3id.org/geosrs/co/GeographicObject</a>
Definition	Identifier of a geographic feature of which the coordinates are used as operation parameters.

Super-classes

[GeographicObject](#)

### 7.1.2. Class: geosrs:RegisterOperations

**Table 29** — geosrs:RegisterOperations

URI

<https://w3id.org/geosrs/co/RegisterOperations>

Definition

Operations supported in the Coordinate Operations package.

### 7.1.3. Class: geosrs:ScaleOperation

**Table 30** — geosrs:ScaleOperation

URI

<https://w3id.org/geosrs/co/ScaleOperation>

Definition

Scale transformation operation

Super-classes

[ScaleOperation](#)

### 7.1.4. Class: geosrs:RotationOperation

**Table 31** — geosrs:RotationOperation

URI

<https://w3id.org/geosrs/co/RotationOperation>

Definition

Rotation transformation operation

Super-classes

[RotationOperation](#)

### 7.1.5. Class: geosrs:IdentityOperation

**Table 32** — geosrs:IdentityOperation

URI

<https://w3id.org/geosrs/co/IdentityOperation>

Definition	Identity transformation operation
Super-classes	<a href="#"><u>IdentityOperation</u></a>

### 7.1.6. Class: geosrs:ShearOperation

**Table 33** — geosrs:ShearOperation

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

### 7.1.7. Class: geosrs:TranslationOperation

**Table 34** — geosrs:TranslationOperation

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

### 7.1.8. Class: geosrs:AffineTransformationOperation

**Table 35** — geosrs:AffineTransformationOperation

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

### 7.1.9. Class: geocrs:CoordinateTransformationOperation

**Table 36** — geocrs:CoordinateTransformationOperation

URI	geocrs:CoordinateTransformationOperation[]
Definition	Coordinate operation in which the two coordinate reference systems are based on different datums.
Super-classes	geocrs:CoordinateTransformationOperation[geocrs:CoordinateTransformationOperation]

## 7.2. Coordinate Operation Methods

### REQUIREMENT 5: COORDINATE OPERATION METHODS

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

### 7.2.1. Class: geocrs:PassThroughOperation

**Table 37** — geocrs:PassThroughOperation

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

### 7.2.2. Class: geocrs:ConcatenatedOperation

**Table 38** — geocrs:ConcatenatedOperation

URI	<a href="https://w3id.org/geocrs/co/ConcatenatedOperation">https://w3id.org/geocrs/co/ConcatenatedOperation</a>
Definition	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.

Super-classes	<a href="#">ConcatenatedOperation</a>
---------------	---------------------------------------

### 7.2.3. Class: geosrs:PointMotionOperation

Table 39 — geosrs:PointMotionOperation

URI	<a href="https://w3id.org/geosrs/co/PointMotionOperation">https://w3id.org/geosrs/co/PointMotionOperation</a>
Definition	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.
Super-classes	<a href="#">PointMotionOperation</a>

## 7.3. Coordinate Operation Parameters

## REQUIREMENT 6: COORDINATE OPERATION PARAMETERS

IDENTIFIER	/req/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 40 — 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="#">OperationParameterGroup</a>

### 7.3.2. Class: geosrs:ParameterValueGroup

Table 41 — 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="#">ParameterValueGroup</a>

## 7.4. Coordinate Operation Properties

## REQUIREMENT 7: COORDINATE OPERATION PROPERTIES

IDENTIFIER	/req/Coordinate_Operation_Properties
STATEMENT	Implementations shall allow the RDFS classes geosrs:derivingConversion, geosrs:parameter, geosrs:sourceCRS, geosrs:targetCRS to be used in SPARQL graph patterns.



8

# COORDINATE SYSTEM MODULE

---

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\_EXTENSION.ADOC EXTENSION

IDENTIFIER	<code>/req/08-cs_extension.adoc</code>
TARGET TYPE	Implementation Specification
REQUIREMENT	<code>/req/Coordinate_System_Types</code>
	<code>/req/Celestial_Coordinate_Systems</code>
	<code>/req/Orthogonal_Coordinate_Systems</code>
	<code>/req/3D_Coordinate_Systems</code>
	<code>/req/Temporal_Coordinate_Systems</code>
	<code>/req/Coordinate_System_Parameters</code>

## 8.1. 3D Coordinate Systems

### REQUIREMENT 8: 3D COORDINATE SYSTEMS

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

#### 8.1.1. Class: `geosrs:CylindricalCoordinateSystem`

**Table 42** — 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
Super-classes	<a href="#">CylindricalCoordinateSystem</a>

## 8.2. Celestial Coordinate Systems

### REQUIREMENT 9: CELESTIAL COORDINATE SYSTEMS

IDENTIFIER	/req/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 43** — 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="#">CelestialCoordinateSystem</a>

#### 8.2.2. Class: geosrs:EclipticCoordinateSystem

**Table 44** — 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="#">EclipticCoordinateSystem</a>
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### 8.2.3. Class: geosrs:EquatorialCoordinateSystem

**Table 45** — 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="#">EquatorialCoordinateSystem</a>

### 8.2.4. Class: geosrs:GalacticCoordinateSystem

**Table 46** — 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 47** — 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="#">HorizontalCoordinateSystem</a>

### 8.2.6. Class: geosrs:PerifocalCoordinateSystem

Table 48 — 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="#">PerifocalCoordinateSystem</a>

### 8.2.7. Class: geosrs:SuperGalacticCS

Table 49 — 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 Parameters

REQUIREMENT 10: COORDINATE SYSTEM PARAMETERS	
IDENTIFIER	/req/Coordinate_System_Parameters
STATEMENT	Implementations shall allow the RDFS classes geosrs:axis, geosrs:axisDirection to be used in SPARQL graph patterns.

## 8.4. Coordinate System Types



## REQUIREMENT 11: COORDINATE SYSTEM TYPES

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

**STATEMENT** Implementations shall allow the RDFS classes geosrs:1DCoordinateSystem, geosrs:3DCoordinateSystem, geosrs:AffineCoordinateSystem, geosrs:BarycentricCoordinateSystem, geosrs:CartesianCoordinateSystem, geosrs:CurvilinearCoordinateSystem, geosrs:EngineeringCoordinateSystem, geosrs:GeodeticCoordinateSystem, geosrs:GridCoordinateSystem, geosrs:HexagonalCoordinateSystem, geosrs:LocalCoordinateSystem, geosrs:ObliqueCoordinateSystem, geosrs:OrdinalCoordinateSystem, geosrs:PlanarCoordinateSystem, geosrs:PolarCoordinateSystem to be used in SPARQL graph patterns.

### 8.4.1. Class: geosrs:1DCoordinateSystem

**Table 50** — 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="#">1DCoordinateSystem</a>

### 8.4.2. Class: geosrs:3DCoordinateSystem

**Table 51** — 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="#">3DCoordinateSystem</a>
Example	<a href="#">geosrs:3DCoordinateSystem</a>

### 8.4.3. Class: geosrs:AffineCoordinateSystem

**Table 52** — geosrs:AffineCoordinateSystem

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

#### 8.4.4. Class: geosrs:BarycentricCoordinateSystem

**Table 53** — geosrs:BarycentricCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/BarycentricCoordinateSystem"><u>https://w3id.org/geosrs/cs/BarycentricCoordinateSystem</u></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="#"><u>BarycentricCoordinateSystem</u></a>

#### 8.4.5. Class: geosrs:CurvilinearCoordinateSystem

**Table 54** — geosrs:CurvilinearCoordinateSystem

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

#### 8.4.6. Class: geosrs:EngineeringCoordinateSystem

**Table 55** — geosrs:EngineeringCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/EngineeringCoordinateSystem"><u>https://w3id.org/geosrs/cs/EngineeringCoordinateSystem</u></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 system, an ordinal coordinate system, a polar coordinate system or a spherical coordinate system

Super-classes	<a href="#">EngineeringCoordinateSystem</a>
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### 8.4.7. Class: geosrs:GeodeticCoordinateSystem

**Table 56** — 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="#">GeodeticCoordinateSystem</a>

### 8.4.8. Class: geosrs:GridCoordinateSystem

**Table 57** — 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="#">GridCoordinateSystem</a>

### 8.4.9. Class: geosrs:HexagonalCoordinateSystem

**Table 58** — 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="#">HexagonalCoordinateSystem</a>

### 8.4.10. Class: geosrs:LocalCoordinateSystem

**Table 59** — 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="#">LocalCoordinateSystem</a>

### 8.4.11. Class: geosrs:ObliqueCoordinateSystem

**Table 60** — 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="#">ObliqueCoordinateSystem</a>

### 8.4.12. Class: geosrs:PlanarCoordinateSystem

**Table 61** — 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="#">PlanarCoordinateSystem</a>
Example	<a href="#">geosrs:PlanarCoordinateSystem</a>

## 8.5. Orthogonal Coordinate Systems

### REQUIREMENT 12: ORTHOGONAL COORDINATE SYSTEMS

IDENTIFIER      /req/Orthogonal\_Coordinate\_Systems

## REQUIREMENT 12: ORTHOGONAL COORDINATE SYSTEMS

STATEMENT	Implementations shall allow the RDFS classes <code>geosrs:ConicalCoordinateSystem</code> , <code>geosrs:EllipsoidalCoordinateSystem</code> to be used in SPARQL graph patterns.
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### 8.5.1. Class: `geosrs:ConicalCoordinateSystem`

Table 62 — `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="#"><code>ConicalCoordinateSystem</code></a>

## 8.6. Temporal Coordinate Systems

## REQUIREMENT 13: TEMPORAL COORDINATE SYSTEMS

IDENTIFIER	<code>/req/Temporal_Coordinate_Systems</code>
STATEMENT	Implementations shall allow the RDFS classes <code>geosrs:DateTimeTemporalCoordinateSystem</code> , <code>geosrs:TemporalCountCoordinateSystem</code> , <code>geosrs:TemporalCoordinateSystem</code> , <code>geosrs:TemporalMeasureCoordinateSystem</code> to be used in SPARQL graph patterns.

### 8.6.1. Class: `geosrs:DateTimeTemporalCoordinateSystem`

Table 63 — `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="#"><code>DateTimeTemporalCoordinateSystem</code></a>

## 8.6.2. Class: geosrs:TemporalCountCoordinateSystem

**Table 64** — 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="#">TemporalCountCoordinateSystem</a>

## 8.6.3. Class: geosrs:TemporalCoordinateSystem

**Table 65** — 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="#">TemporalCoordinateSystem</a>

## 8.6.4. Class: geosrs:TemporalMeasureCoordinateSystem

**Table 66** — 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="#">TemporalMeasureCoordinateSystem</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\_EXTENSION.ADOC EXTENSION

IDENTIFIER	<code>/req/09-datum_extension.adoc</code>
TARGET TYPE	Implementation Specification
REQUIREMENT	<code>/req/Datum_Types</code>
	<code>/req/Datum_Parameters</code>
	<code>/req/Spheroid_Types</code>
	<code>/req/Datum_Properties</code>
	<code>/req/Spheroid_Properties</code>

## 9.1. Datum Parameters

#### REQUIREMENT 14: DATUM PARAMETERS

IDENTIFIER	<code>/req/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 67 — `geosrs:DefiningParameter`

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

## 9.2. Datum Properties

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

## 9.3. Datum Types

Requirement 16: Datum Types	
IDENTIFIER	/req/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 68 — 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 coordinatesExample: defining station coordinates having linear velocities to account for crustal motion.
Super-classes	<a href="#">DynamicGeodeticReferenceFrame</a>

### 9.3.2. Class: geosrs:DynamicVerticalDatum

**Table 69** — 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 dependencyExample: 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="#">DynamicVerticalDatum</a>

### 9.3.3. Class: geosrs:ParametricDatum

**Table 70** — 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="#">ParametricDatum</a>

### 9.3.4. Class: geosrs:EngineeringDatum

**Table 71** — 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="#">EngineeringDatum</a>
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### 9.3.5. Class: geosrs:TemporalDatum

**Table 72** — 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="#">TemporalDatum</a>

### 9.3.6. Class: geosrs:DatumEnsemble

**Table 73** — 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/Spheroid_Properties

REQUIREMENT 17: SPHEROID PROPERTIES

STATEMENT	Implementations shall allow the RDFS classes geosrs:eccentricity, geosrs:inverseFlattening, geosrs:isSphere, geosrs:semiMajorAxis, geosrs:semiMinorAxis to be used in SPARQL graph patterns.
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9.5. Spheroid Types

REQUIREMENT 18: SPHEROID TYPES

IDENTIFIER	/req/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 74 — geosrs:TriaxialEllipsoid

URI	<a href="https://w3id.org/geosrs/datum/TriaxialEllipsoid">https://w3id.org/geosrs/datum/TriaxialEllipsoid</a>
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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This clause establishes the **SRSAPP** Requirements class, with IRI /req/srsapp, which has a corresponding Conformance Class, **SRSAPP**, with IRI /conf/srsapp.



11

# PROJECTIONS MODULE

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# PROJECTIONS MODULE

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

## REQUIREMENTS CLASS 5: 11-PROJECTIONS\_EXTENSION.ADOC EXTENSION

IDENTIFIER	/req/11-projections_extension.adoc
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TARGET TYPE	Implementation Specification
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	/req/Lenticular_Projections
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	/req/Conformal_Projections
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	/req/Minimum_Error_Projections
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	/req/Pseudo_Azimuthal_Projections
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	/req/Equal_Area_Projections
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	/req/Pseudo_Conical_Projections
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	/req/Globular_Projections
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	/req/Pseudo_Cylindrical_Projections
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REQUIREMENT	/req/Cylindrical_Projections
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	/req/Compromise_Projections
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	/req/Polyhedral_Projections
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	/req/Equidistant_Projections
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	/req/Conical_Projections
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	/req/Azimuthal_Projections
--	----------------------------

	/req/Perspective_Projections
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	/req/Polyconic_Projections
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	/req/Stereographic_Projections
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# 11.1. Azimuthal Projections

Requirement 19: Azimuthal Projections	
IDENTIFIER	/req/Azimuthal_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:BreusingGeometricProjection, geosrs:BreusingHarmonicProjection, geosrs:GinzburgIIProjection, geosrs:GinzburgIProjection, geosrs:GnomonicProjection, geosrs:JamesAzimuthalProjection to be used in SPARQL graph patterns.

## 11.1.1. Class: geosrs:BreusingGeometricProjection

Table 75 — geosrs:BreusingGeometricProjection

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

## 11.1.2. Class: geosrs:BreusingHarmonicProjection

Table 76 — geosrs:BreusingHarmonicProjection

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

## 11.1.3. Class: geosrs:GinzburgIIProjection

Table 77 — geosrs:GinzburgIIProjection

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

### 11.1.4. Class: geosrs:GinzburgIProjection

Table 78 — geosrs:GinzburgIProjection

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

### 11.1.5. Class: geosrs:GnomonicProjection

Table 79 — geosrs:GnomonicProjection

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

### 11.1.6. Class: geosrs:JamesAzimuthalProjection

Table 80 — geosrs:JamesAzimuthalProjection

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

## 11.2. Compromise Projections

### REQUIREMENT 20: COMPROMISE PROJECTIONS

IDENTIFIER /req/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 Projection, geosrs:SpilhausOceanicProjection, geosrs:VanDerGrintenIIIProjection, geosrs:Winkel

## REQUIREMENT 20: COMPROMISE PROJECTIONS

IIProjection, geosrs:WinkelIIProjection, geosrs:WinkelSnyderProjection to be used in SPARQL graph patterns.

### 11.2.1. Class: geosrs:ArmadilloProjection

Table 81 — geosrs:ArmadilloProjection

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

### 11.2.2. Class: geosrs:BakerDinomicProjection

Table 82 — geosrs:BakerDinomicProjection

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

### 11.2.3. Class: geosrs:BertinProjection

Table 83 — geosrs:BertinProjection

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

### 11.2.4. Class: geosrs:ChamberlinTrimetricProjection

Table 84 — geosrs:ChamberlinTrimetricProjection

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

### 11.2.5. Class: geosrs:DenoyerSemiEllipticalProjection

**Table 85** — geosrs:DenoyerSemiEllipticalProjection

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

### 11.2.6. Class: geosrs:FairgrieveProjection

**Table 86** — geosrs:FairgrieveProjection

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

### 11.2.7. Class: geosrs:LarriveeProjection

**Table 87** — geosrs:LarriveeProjection

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

### 11.2.8. Class: geosrs:PetermannStarProjection

**Table 88** — geosrs:PetermannStarProjection

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

### 11.2.9. Class: geosrs:SpilhausOceanicProjection

**Table 89** — geosrs:SpilhausOceanicProjection

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

### 11.2.10. Class: geosrs:VanDerGrintenIIIProjection

**Table 90** — geosrs:VanDerGrintenIIIProjection

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

### 11.2.11. Class: geosrs:WinkelIIIProjection

**Table 91** — geosrs:WinkelIIIProjection

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

### 11.2.12. Class: geosrs:WinkelIIProjection

**Table 92** — geosrs:WinkelIIProjection

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

### 11.2.13. Class: geosrs:WinkelSnyderProjection

**Table 93** — geosrs:WinkelSnyderProjection

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

### REQUIREMENT 21: CONFORMAL PROJECTIONS

**IDENTIFIER** /req/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.

### 11.3.1. Class: geosrs:AdamsProjection

**Table 94** — geosrs:AdamsProjection

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

### 11.3.2. Class: geosrs:AdamsWorldInASquarellProjection

**Table 95** — geosrs:AdamsWorldInASquarellProjection

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

### 11.3.3. Class: geosrs:AdamsWorldInASquarelProjection

**Table 96** — geosrs:AdamsWorldInASquareIProjection

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

### 11.3.4. Class: geosrs:AugustEpicycloidalProjection

**Table 97** — 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="#">AugustEpicycloidalProjection</a>

### 11.3.5. Class: geosrs:CoxConformalProjection

**Table 98** — geosrs:CoxConformalProjection

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

### 11.3.6. Class: geosrs:EisenlohrProjection

**Table 99** — geosrs:EisenlohrProjection

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

### 11.3.7. Class: geosrs:GS50Projection

**Table 100** — geosrs:GS50Projection

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

### 11.3.8. Class: geosrs:PeirceQuincuncialProjection

**Table 101** — geosrs:PeirceQuincuncialProjection

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

### 11.3.9. Class: geosrs:StereographicProjection

**Table 102** — geosrs:StereographicProjection

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

## 11.4. Conical Projections

REQUIREMENT 22: CONICAL PROJECTIONS	
IDENTIFIER	/req/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.



### 11.4.1. Class: geosrs:BipolarObliqueConicConformalProjection

**Table 103** — geosrs:BipolarObliqueConicConformalProjection

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

### 11.4.2. Class: geosrs:CentralConicProjection

**Table 104** — geosrs:CentralConicProjection

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

### 11.4.3. Class: geosrs:HerschelConformalConicProjection

**Table 105** — geosrs:HerschelConformalConicProjection

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

### 11.4.4. Class: geosrs:Krovak

**Table 106** — geosrs:Krovak

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

### 11.4.5. Class: geosrs:LambertConformalConicProjection

**Table 107** — geosrs:LambertConformalConicProjection

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

#### 11.4.6. Class: geosrs:MurdochIIIProjection

**Table 108** — geosrs:MurdochIIIProjection

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

#### 11.4.7. Class: geosrs:MurdochIIProjection

**Table 109** — geosrs:MurdochIIProjection

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

#### 11.4.8. Class: geosrs:MurdochIProjection

**Table 110** — geosrs:MurdochIProjection

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

#### 11.4.9. Class: geosrs:SchjerningIProjection

**Table 111** — geosrs:SchjerningIProjection

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

### 11.4.10. Class: geosrs:VitkovskyIProjection

Table 112 — geosrs:VitkovskyIProjection

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

## 11.5. Cylindrical Projections

### REQUIREMENT 23: CYLINDRICAL PROJECTIONS

IDENTIFIER /req/Cylindrical\_Projections

STATEMENT

Implementations shall allow the RDFS classes geosrs:ArdenCloseProjection, geosrs:BraunPerspectiveProjection, geosrs:CompactMillerProjection, geosrs:CylindricalStereographicProjection, geosrs:KarchenkoShabanovaProjection, geosrs:LabordeProjection, geosrs:MercatorProjection, geosrs:MillerProjection, geosrs:PattersonCylindricalProjection, geosrs:PavlovProjection, geosrs:ToblerCylindricalIIIProjection, geosrs:ToblerCylindricalIIProjection, geosrs:UrmayevIIIProjection, geosrs:WebMercatorProjection to be used in SPARQL graph patterns.

### 11.5.1. Class: geosrs:ArdenCloseProjection

Table 113 — geosrs:ArdenCloseProjection

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

### 11.5.2. Class: geosrs:BraunPerspectiveProjection

Table 114 — geosrs:BraunPerspectiveProjection

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

**Table 115** — geosrs:CompactMillerProjection

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

### 11.5.4. Class: geosrs:CylindricalStereographicProjection

**Table 116** — geosrs:CylindricalStereographicProjection

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

### 11.5.5. Class: geosrs:KarchenkoShabanovaProjection

**Table 117** — geosrs:KarchenkoShabanovaProjection

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

### 11.5.6. Class: geosrs:LabordeProjection

**Table 118** — geosrs:LabordeProjection

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

### 11.5.7. Class: geosrs:MercatorProjection

Table 119 — geosrs:MercatorProjection

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

### 11.5.8. Class: geosrs:MillerProjection

Table 120 — geosrs:MillerProjection

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

### 11.5.9. Class: geosrs:PattersonCylindricalProjection

Table 121 — geosrs:PattersonCylindricalProjection

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

### 11.5.10. Class: geosrs:PavlovProjection

Table 122 — geosrs:PavlovProjection

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

### 11.5.11. Class: geosrs:ToblerCylindricalIIIProjection

**Table 123** — geosrs:ToblerCylindricalIIIProjection

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

### 11.5.12. Class: geosrs:ToblerCylindricalIIIProjection

**Table 124** — geosrs:ToblerCylindricalIIIProjection

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

### 11.5.13. Class: geosrs:UrmayevIIIProjection

**Table 125** — geosrs:UrmayevIIIProjection

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

### 11.5.14. Class: geosrs:WebMercatorProjection

**Table 126** — geosrs:WebMercatorProjection

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

## 11.6. Equal Area Projections

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## REQUIREMENT 24: EQUAL AREA PROJECTIONS

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

**STATEMENT**

Implementations shall allow the RDFS classes `geosrs:AlbersEqualAreaProjection`, `geosrs:AzimuthalEqualAreaProjection`, `geosrs:CylindricalEqualArea`, `geosrs:GallPetersProjection`, `geosrs:HoboDyerProjection`, `geosrs:LambertAzimuthalEqualArea`, `geosrs:TrystanEdwardsProjection`, `geosrs:WiechelProjection` to be used in SPARQL graph patterns.

### 11.6.1. Class: `geosrs:AlbersEqualAreaProjection`

**Table 127** — `geosrs:AlbersEqualAreaProjection`

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

### 11.6.2. Class: `geosrs:AzimuthalEqualAreaProjection`

**Table 128** — `geosrs:AzimuthalEqualAreaProjection`

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

### 11.6.3. Class: `geosrs:CylindricalEqualArea`

**Table 129** — `geosrs:CylindricalEqualArea`

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

### 11.6.4. Class: `geosrs:GallPetersProjection`

**Table 130** — geosrs:GallPetersProjection

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

### 11.6.5. Class: geosrs:HoboDyerProjection

**Table 131** — geosrs:HoboDyerProjection

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

### 11.6.6. Class: geosrs:LambertAzimuthalEqualArea

**Table 132** — geosrs:LambertAzimuthalEqualArea

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

### 11.6.7. Class: geosrs:TrystanEdwardsProjection

**Table 133** — geosrs:TrystanEdwardsProjection

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

### 11.6.8. Class: geosrs:WiechelProjection

**Table 134** — geosrs:WiechelProjection

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



# 11.7. Equidistant Projections

## REQUIREMENT 25: EQUIDISTANT PROJECTIONS

**IDENTIFIER** /req/Equidistant\_Projections

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

### 11.7.1. Class: geosrs:AzimuthalEquidistantProjection

Table 135 — geosrs:AzimuthalEquidistantProjection

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

### 11.7.2. Class: geosrs:BerghausStarProjection

Table 136 — geosrs:BerghausStarProjection

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

### 11.7.3. Class: geosrs:CassiniProjection

Table 137 — 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="#">CassiniProjection</a>
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#### 11.7.4. Class: geosrs:EquidistantConicProjection

**Table 138** — geosrs:EquidistantConicProjection

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

#### 11.7.5. Class: geosrs:EquidistantCylindricalProjection

**Table 139** — geosrs:EquidistantCylindricalProjection

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

#### 11.7.6. Class: geosrs:EquirectangularProjection

**Table 140** — geosrs:EquirectangularProjection

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

#### 11.7.7. Class: geosrs:ObliquePlateCarreeProjection

**Table 141** — geosrs:ObliquePlateCarreeProjection

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

### 11.7.8. Class: geosrs:PlateCarreeProjection

Table 142 — geosrs:PlateCarreeProjection

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

### 11.7.9. Class: geosrs:TwoPointEquidistantProjection

Table 143 — geosrs:TwoPointEquidistantProjection

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

## 11.8. Globular Projections

### REQUIREMENT 26: GLOBULAR PROJECTIONS

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

### 11.8.1. Class: geosrs:ApianGlobularIProjection

Table 144 — geosrs:ApianGlobularIProjection

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

### 11.8.2. Class: geosrs:BaconGlobularProjection

Table 145 — geosrs:BaconGlobularProjection

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

### 11.8.3. Class: geosrs:FournierGlobularIProjection

Table 146 — geosrs:FournierGlobularIProjection

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

## 11.9. Lenticular Projections

### REQUIREMENT 27: LENTICULAR PROJECTIONS

IDENTIFIER	/req/Lenticular_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:A4Projection, geosrs:BriesemeisterProjection, geosrs:CiricIProjection, geosrs:CupolaProjection, geosrs:DedistortProjection, geosrs:DietrichKitadaProjection, geosrs:FranculaIIIProjection, 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.

### 11.9.1. Class: geosrs:A4Projection

Table 147 — geosrs:A4Projection

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

**Table 148** — geosrs:BriesemeisterProjection

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

### 11.9.3. Class: geosrs:CiricIProjection

**Table 149** — geosrs:CiricIProjection

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

### 11.9.4. Class: geosrs:CupolaProjection

**Table 150** — geosrs:CupolaProjection

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

### 11.9.5. Class: geosrs:DedistortProjection

**Table 151** — geosrs:DedistortProjection

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

### 11.9.6. Class: geosrs:DietrichKitadaProjection

Table 152 — geosrs:DietrichKitadaProjection

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

### 11.9.7. Class: geosrs:FranculaIIIProjection

Table 153 — geosrs:FranculaIIIProjection

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

### 11.9.8. Class: geosrs:FranculaIVProjection

Table 154 — geosrs:FranculaIVProjection

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

### 11.9.9. Class: geosrs:FranculaIXProjection

Table 155 — geosrs:FranculaIXProjection

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

### 11.9.10. Class: geosrs:FranculaVIIIProjection

**Table 156** — geosrs:FraculaVIIIProjection

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

### 11.9.11. Class: geosrs:FraculaVProjection

**Table 157** — geosrs:FraculaVProjection

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

### 11.9.12. Class: geosrs:FraculaXIIIProjection

**Table 158** — geosrs:FraculaXIIIProjection

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

### 11.9.13. Class: geosrs:FraculaXIIProjection

**Table 159** — geosrs:FraculaXIIProjection

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

### 11.9.14. Class: geosrs:FraculaXIVProjection

**Table 160** — geosrs:FraculaXIVProjection

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

**Table 161** — geosrs:HamusoidalProjection

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

### 11.9.16. Class: geosrs:KissProjection

**Table 162** — geosrs:KissProjection

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

## 11.10. Minimum Error Projections

### REQUIREMENT 28: MINIMUM ERROR PROJECTIONS

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

### 11.10.1. Class: geosrs:AiryProjection

**Table 163** — geosrs:AiryProjection

URI	<a href="https://w3id.org/geosrs/projection/AiryProjection">https://w3id.org/geosrs/projection/AiryProjection</a>
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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="#">AiryProjection</a>

# 11.11. Perspective Projections

## REQUIREMENT 29: PERSPECTIVE PROJECTIONS

IDENTIFIER	/req/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:TiltedPerspectiveProjection</code> , <code>geosrs:VerticalPerspectiveProjection</code> to be used in SPARQL graph patterns.

### 11.11.1. Class: `geosrs:CentralCylindricalProjection`

Table 164 — `geosrs:CentralCylindricalProjection`

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

### 11.11.2. Class: `geosrs:GeneralVerticalPerspectiveProjection`

Table 165 — `geosrs:GeneralVerticalPerspectiveProjection`

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

### 11.11.3. Class: geosrs:GilbertTwoWorldPerspectiveProjection

Table 166 — geosrs:GilbertTwoWorldPerspectiveProjection

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

### 11.11.4. Class: geosrs:LaHireProjection

Table 167 — geosrs:LaHireProjection

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

### 11.11.5. Class: geosrs:LorgnaProjection

Table 168 — geosrs:LorgnaProjection

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

### 11.11.6. Class: geosrs:LowryProjection

Table 169 — geosrs:LowryProjection

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

### 11.11.7. Class: geosrs:OrthographicProjection

**Table 170** — geosrs:OrthographicProjection

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

### 11.11.8. Class: geosrs:PerspectiveConicProjection

**Table 171** — geosrs:PerspectiveConicProjection

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

### 11.11.9. Class: geosrs:TiltedPerspectiveProjection

**Table 172** — geosrs:TiltedPerspectiveProjection

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

### 11.11.10. Class: geosrs:VerticalPerspectiveProjection

**Table 173** — geosrs:VerticalPerspectiveProjection

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

## 11.12. Polyconic Projections

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## REQUIREMENT 30: POLYCONIC PROJECTIONS

**IDENTIFIER** /req/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:RectangularPolyconicProjection, geosrs:StabiusWernerIIIProjection, geosrs:StabiusWernerIProjection, geosrs:VanDerGrintenIIProjection, geosrs:VanDerGrintenIProjection, geosrs:VanDerGrintenIVProjection, geosrs:WagnerIXProjection, geosrs:WagnerVIIIProjection, geosrs:WagnerVIIProjection to be used in SPARQL graph patterns.

### 11.12.1. Class: geosrs:GinzburgIVProjection

**Table 174** — geosrs:GinzburgIVProjection

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

### 11.12.2. Class: geosrs:GinzburgIXProjection

**Table 175** — geosrs:GinzburgIXProjection

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

### 11.12.3. Class: geosrs:GinzburgVIPProjection

**Table 176** — geosrs:GinzburgVIPProjection

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

### 11.12.4. Class: geosrs:GinzburgVProjection

**Table 177** — geosrs:GinzburgVProjection

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

### 11.12.5. Class: geosrs:GottWagnerProjection

**Table 178** — geosrs:GottWagnerProjection

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

### 11.12.6. Class: geosrs:HillEucyclicProjection

**Table 179** — geosrs:HillEucyclicProjection

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

### 11.12.7. Class: geosrs:LagrangeProjection

**Table 180** — geosrs:LagrangeProjection

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

### 11.12.8. Class: geosrs:LaskowskiProjection

**Table 181** — geosrs:LaskowskiProjection

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

### 11.12.9. Class: geosrs:RectangularPolyconicProjection

Table 182 — geosrs:RectangularPolyconicProjection

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

### 11.12.10. Class: geosrs:StabiusWernerIIIProjection

Table 183 — geosrs:StabiusWernerIIIProjection

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

### 11.12.11. Class: geosrs:StabiusWernerIProjection

Table 184 — geosrs:StabiusWernerIProjection

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

### 11.12.12. Class: geosrs:VanDerGrintenIIProjection

Table 185 — geosrs:VanDerGrintenIIProjection

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

### 11.12.13. Class: geosrs:VanDerGrintenIProjection

**Table 186** — geosrs:VanDerGrintenIProjection

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

#### 11.12.14. Class: geosrs:VanDerGrintenIVProjection

**Table 187** — geosrs:VanDerGrintenIVProjection

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

#### 11.12.15. Class: geosrs:WagnerIXProjection

**Table 188** — geosrs:WagnerIXProjection

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

#### 11.12.16. Class: geosrs:WagnerVIIIProjection

**Table 189** — geosrs:WagnerVIIIProjection

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

#### 11.12.17. Class: geosrs:WagnerVIIProjection

**Table 190** — geosrs:WagnerVIIProjection

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

# 11.13. Polyhedral Projections

## REQUIREMENT 31: POLYHEDRAL PROJECTIONS

IDENTIFIER	/req/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:QuadrilateralizedSphericalCubeProjection, geosrs:WatermanButterflyProjection to be used in SPARQL graph patterns.

### 11.13.1. Class: geosrs:AuthaGraphProjection

Table 191 — geosrs:AuthaGraphProjection

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

### 11.13.2. Class: geosrs:CahillKeyesProjection

Table 192 — geosrs:CahillKeyesProjection

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

### 11.13.3. Class: geosrs:CollignonButterflyProjection

Table 193 — geosrs:CollignonButterflyProjection

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



#### 11.13.4. Class: geosrs:DodecahedralProjection

Table 194 — geosrs:DodecahedralProjection

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

#### 11.13.5. Class: geosrs:DymaxionProjection

Table 195 — geosrs:DymaxionProjection

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

#### 11.13.6. Class: geosrs:GnomonicButterflyProjection

Table 196 — geosrs:GnomonicButterflyProjection

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

#### 11.13.7. Class: geosrs:GnomonicCubedSphereProjection

Table 197 — geosrs:GnomonicCubedSphereProjection

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

#### 11.13.8. Class: geosrs:GnomonicIcosahedronProjection

**Table 198** — geosrs:GnomonicCosahedronProjection

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

### 11.13.9. Class: geosrs:GuyouProjection

**Table 199** — geosrs:GuyouProjection

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

### 11.13.10. Class: geosrs:IcosahedralProjection

**Table 200** — geosrs:IcosahedralProjection

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

### 11.13.11. Class: geosrs:LeeProjection

**Table 201** — geosrs:LeeProjection

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

### 11.13.12. Class: geosrs:MyrahedralProjection

**Table 202** — geosrs:MyrahedralProjection

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

### 11.13.13. Class: geosrs:OctantProjection

Table 203 — geosrs:OctantProjection

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

### 11.13.14. Class: geosrs:QuadrilateralizedSphericalCubeProjection

Table 204 — geosrs:QuadrilateralizedSphericalCubeProjection

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

### 11.13.15. Class: geosrs:WatermanButterflyProjection

Table 205 — geosrs:WatermanButterflyProjection

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

## 11.14. Pseudo Azimuthal Projections

#### REQUIREMENT 32: PSEUDO AZIMUTHAL PROJECTIONS

IDENTIFIER	/req/Pseudo_Azimuthal_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:AitoffObliqueProjection, geosrs:Aitoff Projection, geosrs:HammerProjection, geosrs:Strebe1995Projection, geosrs:WinkelTripel Projection to be used in SPARQL graph patterns.

### 11.14.1. Class: geosrs:AitoffObliqueProjection

Table 206 — geosrs:AitoffObliqueProjection

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

### 11.14.2. Class: geosrs:AitoffProjection

Table 207 — 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="#">AitoffProjection</a>

### 11.14.3. Class: geosrs:HammerProjection

Table 208 — geosrs:HammerProjection

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

### 11.14.4. Class: geosrs:Strebe1995Projection

Table 209 — geosrs:Strebe1995Projection

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

### 11.14.5. Class: geosrs:WinkelTripelProjection

Table 210 — geosrs:WinkelTripelProjection

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

## 11.15. Pseudo Conical Projections

### REQUIREMENT 33: PSEUDO CONICAL PROJECTIONS

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

### 11.15.1. Class: geosrs:AmericanPolyconicProjection

Table 211 — geosrs:AmericanPolyconicProjection

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

### 11.15.2. Class: geosrs:BonneProjection

Table 212 — geosrs:BonneProjection

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

### 11.15.3. Class: geosrs:BottomleyProjection

Table 213 — geosrs:BottomleyProjection

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

### 11.15.4. Class: geosrs:NicolosiGlobularProjection

Table 214 — geosrs:NicolosiGlobularProjection

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

### 11.15.5. Class: geosrs:PtolemyIIProjection

Table 215 — geosrs:PtolemyIIProjection

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

### 11.15.6. Class: geosrs:WernerProjection

Table 216 — geosrs:WernerProjection

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

# 11.16. Pseudo Cylindrical Projections

## REQUIREMENT 34: PSEUDO CYLINDRICAL PROJECTIONS

IDENTIFIER	/req/Pseudo_Cylindrical_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:ApianIIProjection, geosrs:AtlantisProjection, geosrs:BaranyIIIIProjection, geosrs:BaranyIIProjection, geosrs:BaranyIProjection, 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: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: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.

### 11.16.1. Class: geosrs:ApianIIProjection

Table 217 – geosrs:ApianIIProjection

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

### 11.16.2. Class: geosrs:AtlantisProjection

**Table 218** — geosrs:AtlantisProjection

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

### 11.16.3. Class: geosrs:BaranyillProjection

**Table 219** — geosrs:BaranyillProjection

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

### 11.16.4. Class: geosrs:BaranyillProjection

**Table 220** — geosrs:BaranyillProjection

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

### 11.16.5. Class: geosrs:BaranyilProjection

**Table 221** — geosrs:BaranyilProjection

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

### 11.16.6. Class: geosrs:BaranyilVProjection

**Table 222** — geosrs:BaranyilVProjection

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



### 11.16.7. Class: geosrs:BoggsEumorphicProjection

Table 223 — geosrs:BoggsEumorphicProjection

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

### 11.16.8. Class: geosrs:BromleyProjection

Table 224 — geosrs:BromleyProjection

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

### 11.16.9. Class: geosrs:CabotProjection

Table 225 — geosrs:CabotProjection

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

### 11.16.10. Class: geosrs:CollignonProjection

Table 226 — 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="#">CollignonProjection</a>

### 11.16.11. Class: geosrs:CrasterParabolicProjection

Table 227 — geosrs:CrasterParabolicProjection

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

### 11.16.12. Class: geosrs:DeakinMinimumErrorProjection

Table 228 — geosrs:DeakinMinimumErrorProjection

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

### 11.16.13. Class: geosrs:Eckert1Projection

Table 229 — geosrs:Eckert1Projection

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

### 11.16.14. Class: geosrs:Eckert2Projection

Table 230 — geosrs:Eckert2Projection

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

### 11.16.15. Class: geosrs:Eckert3Projection

**Table 231** — geosrs:Eckert3Projection

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

### 11.16.16. Class: geosrs:Eckert4Projection

**Table 232** — geosrs:Eckert4Projection

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

### 11.16.17. Class: geosrs:Eckert5Projection

**Table 233** — geosrs:Eckert5Projection

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

### 11.16.18. Class: geosrs:Eckert6Projection

**Table 234** — geosrs:Eckert6Projection

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

### 11.16.19. Class: geosrs:EqualEarthProjection

**Table 235** — geosrs:EqualEarthProjection

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

### 11.16.20. Class: geosrs:FaheyProjection

Table 236 — geosrs:FaheyProjection

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

### 11.16.21. Class: geosrs:FoucautProjection

Table 237 — geosrs:FoucautProjection

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

### 11.16.22. Class: geosrs:FoucautSinusoidalProjection

Table 238 — geosrs:FoucautSinusoidalProjection

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

### 11.16.23. Class: geosrs:FournierIIProjection

Table 239 — geosrs:FournierIIProjection

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

### 11.16.24. Class: geosrs:GinzburgVIIIProjection

**Table 240** — geosrs:GinzburgVIIIProjection

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

### 11.16.25. Class: geosrs:GoodeHomolosineProjection

**Table 241** — geosrs:GoodeHomolosineProjection

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

### 11.16.26. Class: geosrs:HEALPixProjection

**Table 242** — geosrs:HEALPixProjection

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

### 11.16.27. Class: geosrs:HufnagelProjection

**Table 243** — geosrs:HufnagelProjection

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

### 11.16.28. Class: geosrs:Kavrayskiy7Projection

**Table 244** — geosrs:Kavrayskiy7Projection

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

**Table 245** — geosrs:LoximuthalProjection

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

### 11.16.30. Class: geosrs:MayrProjection

**Table 246** — geosrs:MayrProjection

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

### 11.16.31. Class: geosrs:McBrydeThomasFlatPolarParabolicProjection

**Table 247** — geosrs:McBrydeThomasFlatPolarParabolicProjection

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

### 11.16.32. Class: geosrs:McBrydeThomasFlatPolarQuarticProjection

**Table 248** — geosrs:McBrydeThomasFlatPolarQuarticProjection

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

### 11.16.33. Class: geosrs:McBrydeThomasFlatPolarSinusoidalProjection

Table 249 — geosrs:McBrydeThomasFlatPolarSinusoidalProjection

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

### 11.16.34. Class: geosrs:McBrydeThomasIIProjection

Table 250 — geosrs:McBrydeThomasIIProjection

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

### 11.16.35. Class: geosrs:McBrydeThomasIProjection

Table 251 — geosrs:McBrydeThomasIProjection

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

### 11.16.36. Class: geosrs:NaturalEarth2Projection

Table 252 — geosrs:NaturalEarth2Projection

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

### 11.16.37. Class: geosrs:NaturalEarthProjection

**Table 253 — 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="#">NaturalEarthProjection</a>

### 11.16.38. Class: geosrs:NellHammerProjection

**Table 254 — geosrs:NellHammerProjection**

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

### 11.16.39. Class: geosrs:NellProjection

**Table 255 — geosrs:NellProjection**

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

### 11.16.40. Class: geosrs:OrteliusOvalProjection

**Table 256 — geosrs:OrteliusOvalProjection**

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

### 11.16.41. Class: geosrs:PutninsP1Projection



**Table 257** — geosrs:PutninsP1Projection

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

### 11.16.42. Class: geosrs:PutninsP2Projection

**Table 258** — geosrs:PutninsP2Projection

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

### 11.16.43. Class: geosrs:PutninsP3Projection

**Table 259** — geosrs:PutninsP3Projection

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

### 11.16.44. Class: geosrs:PutninsP5Projection

**Table 260** — geosrs:PutninsP5Projection

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

### 11.16.45. Class: geosrs:PutninsP6Projection

**Table 261** — geosrs:PutninsP6Projection

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

### 11.16.46. Class: geosrs:QuarticAuthalicProjection

Table 262 — geosrs:QuarticAuthalicProjection

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

### 11.16.47. Class: geosrs:RobinsonProjection

Table 263 — geosrs:RobinsonProjection

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

### 11.16.48. Class: geosrs:SinusoidalProjection

Table 264 — geosrs:SinusoidalProjection

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

### 11.16.49. Class: geosrs:TheTimesProjection

Table 265 — geosrs:TheTimesProjection

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

### 11.16.50. Class: geosrs:ToblerG1Projection

**Table 266** — geosrs:ToblerG1Projection

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

### 11.16.51. Class: geosrs:ToblerHyperellipticalProjection

**Table 267** — geosrs:ToblerHyperellipticalProjection

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

### 11.16.52. Class: geosrs:WagnerIIIProjection

**Table 268** — geosrs:WagnerIIIProjection

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

### 11.16.53. Class: geosrs:WagnerIIProjection

**Table 269** — geosrs:WagnerIIProjection

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

### 11.16.54. Class: geosrs:WagnerIProjection

**Table 270** — geosrs:WagnerIProjection

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

### 11.16.55. Class: geosrs:WagnerIVProjection

Table 271 — geosrs:WagnerIVProjection

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

### 11.16.56. Class: geosrs:WagnerVIPProjection

Table 272 — geosrs:WagnerVIPProjection

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

### 11.16.57. Class: geosrs:WagnerVProjection

Table 273 — geosrs:WagnerVProjection

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

### 11.16.58. Class: geosrs:WerenskioldIProjection

Table 274 — geosrs:WerenskioldIProjection

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

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

**Table 275** — 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="#">PutninsP3'Projection</a>

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

**Table 276** — 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="#">PutninsP4'Projection</a>

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

**Table 277** — 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="#">PutninsP5'Projection</a>

### 11.16.62. Class: geosrs:PutninsP6'Projection

**Table 278** — 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="#">PutninsP6'Projection</a>

## 11.17. Stereographic Projections

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REQUIREMENT 35: STEREOGRAPHIC PROJECTIONS

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

11.17.1. Class: geosrs:MillerOblatedStereographicProjection

Table 279 — geosrs:MillerOblatedStereographicProjection

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

11.17.2. Class: geosrs:RoussilheProjection

Table 280 — geosrs:RoussilheProjection

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



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# 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.









# ANNEX A (INFORMATIVE) ALIGNMENTS

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# ANNEX A (INFORMATIVE) ALIGNMENTS

## Overview

## Overview

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

**Table A.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>

## A.1. IGN Ontology

**Table A.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>	-

## A.2. ISO19111 Ontology

**Table A.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>	-

## A.3. IFC Ontology

**Table A.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>	-



# ANNEX B (INFORMATIVE) SHACL SHAPES

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## ANNEX B (INFORMATIVE) SHACL SHAPES

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Overview

### Overview

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# ANNEX C (INFORMATIVE) REVISION HISTORY

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## ANNEX C (INFORMATIVE) REVISION HISTORY

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



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## 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)

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