

# OGC DOCUMENT TITLE

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**APPROVED**

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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.

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

---

All questions regarding this submission should be directed to the editor or the submitters:

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Luís Moreira de Sousa	Instituto Superior Técnico: Lisbon, PT	Yes
Timo Homburg	Mainz University Of Applied Sciences	No
Nathalie Abadie	IGN France	Yes
Ghislain Atemezing	European Union Agency for Railways (ERA)	Yes

**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.

Additional contributors to this Standard include the following:

Individual name(s), Organization

1

# SCOPE

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## SCOPE

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<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

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<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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## NORMATIVE REFERENCES

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

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

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

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



4

# TERMS AND DEFINITIONS

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

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

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

## 4.1. example term

term used for exemplary purposes

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

Example      Here's an example of an example term.

[SOURCE: ]



5

# CONVENTIONS

---

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

## 5.1. Identifiers

The normative provisions in this standard are denoted by the URI

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

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

## 5.2. Other conventions

<Place any other convention needed with its corresponding title>

6

# CORE

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

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



Figure 1

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

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

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

## 6.1. Coordinate Reference System Parameters

### REQUIREMENT 1: COORDINATE REFERENCE SYSTEM PARAMETERS

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

### 6.1.1. Class: geosrs:AreaOfUse

Table 1 – geosrs:AreaOfUse

URI	<a href="https://w3id.org/geosrs/srs/AreaOfUse">https://w3id.org/geosrs/srs/AreaOfUse</a>
Definition	Area within which a coordinate operation may be used.
Super-classes	geo:Feature[geo:Feature]
Example	<code>geosrs:AreaOfUse</code>

### 6.1.2. Class: geosrs:Extent

**Table 2 – geosrs:Extent**

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

### 6.1.3. Class: geosrs:GeographicBoundingBox

**Table 3 – geosrs:GeographicBoundingBox**

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

### 6.1.4. Class: geosrs:AxesList

**Table 4 – geosrs:AxesList**

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

### 6.1.5. Class: geosrs:SingleCRSList

**Table 5 – geosrs:SingleCRSList**

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

## 6.2. Coordinate Reference System Properties

---

## REQUIREMENT 2: COORDINATE REFERENCE SYSTEM PROPERTIES

IDENTIFIER	/req/core/Coordinate_Reference_System_Properties
STATEMENT	Implementations shall allow the RDFS properties geosrs:method to be used in SPARQL graph patterns.

### 6.2.1. Property: geosrs:method

Table 6 – geosrs:method

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

## 6.3. Coordinate Reference System Types

### REQUIREMENT 3: COORDINATE REFERENCE SYSTEM TYPES

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

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

### 6.3.1. Class: geosrs:BoundCRS

**Table 7 – geosrs:BoundCRS**

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

### 6.3.2. Class: geosrs:CompoundCRS

**Table 8 – geosrs:CompoundCRS**

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

### 6.3.3. Class: geosrs:CRS

**Table 9 – geosrs:CRS**

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

### 6.3.4. Class: geosrs:EngineeringCRS

**Table 10 – geosrs:EngineeringCRS**

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

### 6.3.5. Class: geosrs:GeocentricCRS

**Table 11 – geosrs:GeocentricCRS**

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

### 6.3.6. Class: geosrs:GeodeticCRS

**Table 12 – geosrs:GeodeticCRS**

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

### 6.3.7. Class: geosrs:GeographicCRS

**Table 13 – geosrs:GeographicCRS**

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

### 6.3.8. Class: geosrs:ParametricCRS

**Table 14 – geosrs:ParametricCRS**

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

### 6.3.9. Class: geosrs:ProjectedCRS

**Table 15 – geosrs:ProjectedCRS**

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

### 6.3.10. Class: geosrs:SelenographicCRS

**Table 16** – geosrs:SelenographicCRS

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

### 6.3.11. Class: geosrs:ReferenceSystem

**Table 17** – 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 18** – geosrs:SingleCRS

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

### 6.3.13. Class: geosrs:SpatialReferenceSystem

**Table 19** – geosrs:SpatialReferenceSystem

URI	<a href="https://w3id.org/geosrs/srs/SpatialReferenceSystem">https://w3id.org/geosrs/srs/SpatialReferenceSystem</a>
Definition	A spatial reference system (SRS) is a system for establishing spatial position. A spatial reference system can use geographic identifiers (place names, for example), coordinates (in which case it is a coordinate reference

	system), or identifiers with structured geometry (in which case it is a discrete global grid system).
Super-classes	<a href="#">ReferenceSystem</a>

### 6.3.14. Class: geosrs:SpatialParametricCompoundCRS

**Table 20** – geosrs:SpatialParametricCompoundCRS

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

### 6.3.15. Class: geosrs:SpatialParametricTemporalCompoundCRS

**Table 21** – geosrs:SpatialParametricTemporalCompoundCRS

URI	<a href="https://w3id.org/geosrs/srs/&lt;br/&gt;SpatialParametricTemporalCompoundCRS">https://w3id.org/geosrs/srs/ SpatialParametricTemporalCompoundCRS</a>
Definition	Coordinate reference system combining a spatio-parametric reference system with at least one temporal reference system
Super-classes	<a href="#">SpatioParametricCompoundCRS</a>

### 6.3.16. Class: geosrs:SpatialTemporalCompoundCRS

**Table 22** – geosrs:SpatialTemporalCompoundCRS

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

### 6.3.17. Class: geosrs:StaticCRS

**Table 23 – geosrs:StaticCRS**

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

### 6.3.18. Class: geosrs:TemporalCRS

**Table 24 – geosrs:TemporalCRS**

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

### 6.3.19. Class: geosrs:VerticalCRS

**Table 25 – geosrs:VerticalCRS**

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



7

# COORDINATE OPERATION MODULE

---

# 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.



Figure 2

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

IDENTIFIER	/req/co
TARGET TYPE	Implementation Specification
CONFORMANCE CLASS	Conformance class A.2: /conf/co
REQUIREMENT	<ul style="list-style-type: none"> <li>/req/co/Coordinate_Operation_Methods</li> <li>/req/co/Coordinate_Operation_Parameters</li> <li>/req/co/Coordinate_Operation_Categories</li> <li>/req/co/Coordinate_Operation_Properties</li> </ul>

## 7.1. Coordinate Operation Categories

### REQUIREMENT 4: COORDINATE OPERATION CATEGORIES

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

### 7.1.1. Class: geosrs:GeographicObject

**Table 26** – 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	<a href="#">Geometry#Geometry</a>

### 7.1.2. Class: geosrs:RegisterOperations

**Table 27** – geosrs:RegisterOperations

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

### 7.1.3. Class: geosrs:ScaleOperation

**Table 28** – geosrs:ScaleOperation

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

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

#### 7.1.4. Class: geosrs:RotationOperation

**Table 29** – geosrs:RotationOperation

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

#### 7.1.5. Class: geosrs:IdentityOperation

**Table 30** – geosrs:IdentityOperation

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

#### 7.1.6. Class: geosrs:ShearOperation

**Table 31** – geosrs:ShearOperation

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

#### 7.1.7. Class: geosrs:TranslationOperation

**Table 32 – geosrs:TranslationOperation**

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

## 7.1.8. Class: geosrs:AffineTransformationOperation

**Table 33 – geosrs:AffineTransformationOperation**

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

## 7.1.9. Class: geosrs:CoordinateTransformationOperation

**Table 34 – geosrs:CoordinateTransformationOperation**

URI	<a href="https://w3id.org/geosrs/co/CoordinateTransformationOperation">https://w3id.org/geosrs/co/CoordinateTransformationOperation</a>
Definition	Coordinate operation in which the two coordinate reference systems are based on different datums.
Super-classes	<a href="#">SingleOperation</a>

## 7.2. Coordinate Operation Methods

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### REQUIREMENT 5: COORDINATE OPERATION METHODS

IDENTIFIER	/req/co/Coordinate_Operation_Methods
STATEMENT	Implementations shall allow the RDFS classes geosrs:CoordinateOperation, geosrs:PassThroughOperation, geosrs:ConcatenatedOperation, geosrs:SingleOperation, geosrs:Transformation,

## REQUIREMENT 5: COORDINATE OPERATION METHODS

geosrs:Conversion, geosrs:PointMotionOperation, geosrs:OperationMethod to be used in SPARQL graph patterns.

### 7.2.1. Class: geosrs:PassThroughOperation

**Table 35** – geosrs:PassThroughOperation

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

### 7.2.2. Class: geosrs:ConcatenatedOperation

**Table 36** – geosrs:ConcatenatedOperation

URI	<a href="https://w3id.org/geosrs/co/ConcatenatedOperation">https://w3id.org/geosrs/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. $1 \dots (n - 1)$ 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

[CoordinateOperation](#)

### 7.2.3. Class: geosrs:PointMotionOperation

**Table 37** – 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="#">SingleOperation</a>

## 7.3. Coordinate Operation Parameters

### REQUIREMENT 6: COORDINATE OPERATION PARAMETERS

**IDENTIFIER** /req/co/Coordinate\_Operation\_Parameters

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

### 7.3.1. Class: geosrs:OperationParameterGroup

**Table 38** – geosrs:OperationParameterGroup

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

### 7.3.2. Class: geosrs:ParameterValueGroup

**Table 39** – geosrs:ParameterValueGroup

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

## 7.4. Coordinate Operation Properties

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### REQUIREMENT 7: COORDINATE OPERATION PROPERTIES

**IDENTIFIER** /req/co/Coordinate\_Operation\_Properties

**STATEMENT** Implementations shall allow the RDFS properties geosrs:derivingConversion, geosrs:parameter, geosrs:sourceCRS, geosrs:targetCRS to be used in SPARQL graph patterns.

### 7.4.1. Property: geosrs:derivingConversion

**Table 40** – geosrs:derivingConversion

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

## 7.4.2. Property: geosrs:parameter

**Table 41** – geosrs:parameter

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

## 7.4.3. Property: geosrs:sourceCRS

**Table 42** – geosrs:sourceCRS

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

## 7.4.4. Property: geosrs:targetCRS

**Table 43** – geosrs:targetCRS

URI	<a href="https://w3id.org/geosrs/co/targetCRS">https://w3id.org/geosrs/co/targetCRS</a>
-----	---

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



8

# COORDINATE SYSTEM MODULE

---

# 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.

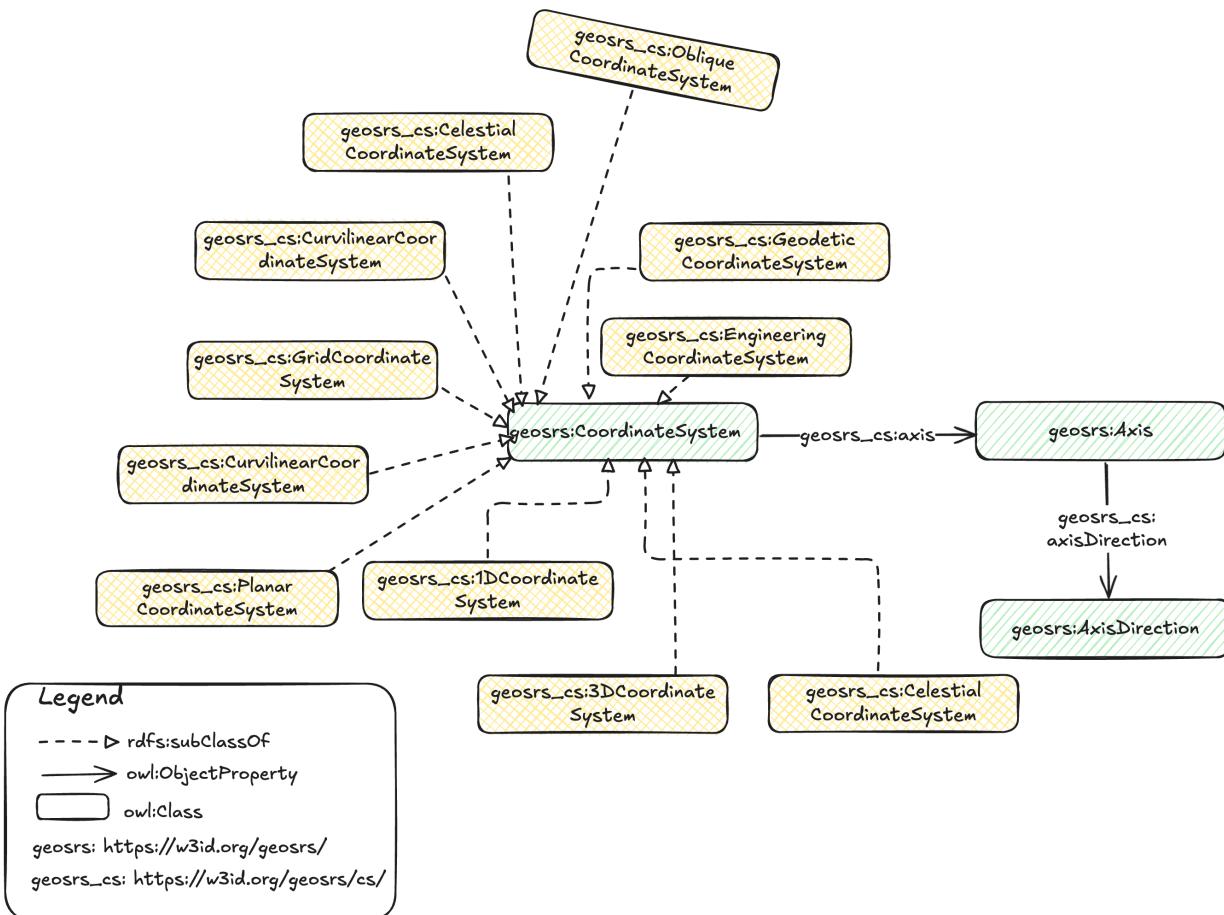


Figure 3

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

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

IDENTIFIER	/req/cs
TARGET TYPE	Implementation Specification
CONFORMANCE CLASS	Conformance class A.3: /conf/cs

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

REQUIREMENT	/req/cs/Temporal_Coordinate_Systems
	/req/cs/3D_Coordinate_Systems
	/req/cs/Coordinate_System_Types
	/req/cs/Celestial_Coordinate_Systems
	/req/cs/Coordinate_System_Components
	/req/cs/Coordinate_System_Properties

## 8.1. 3D Coordinate Systems

### REQUIREMENT 8: 3D COORDINATE SYSTEMS

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

### 8.1.1. Class: geosrs:3DCoordinateSystem

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

**Table 44 – geosrs:3DCoordinateSystem**

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

### 8.1.2. Class: geosrs:ConicalCoordinateSystem

**Table 45** – geosrs:ConicalCoordinateSystem

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

### 8.1.3. Class: geosrs:CylindricalCoordinateSystem

**Table 46** – 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="#">3DCoordinateSystem</a>

## 8.2. Celestial Coordinate Systems

---

### REQUIREMENT 9: CELESTIAL COORDINATE SYSTEMS

**IDENTIFIER** /req/cs/Celestial\_Coordinate\_Systems

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

## 8.2.1. Class: geosrs:CelestialCoordinateSystem

**Table 47** – geosrs:CelestialCoordinateSystem

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

## 8.2.2. Class: geosrs:EclipticCoordinateSystem

**Table 48** – geosrs:EclipticCoordinateSystem

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

## 8.2.3. Class: geosrs:EquatorialCoordinateSystem

**Table 49** – geosrs:EquatorialCoordinateSystem

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

## 8.2.4. Class: geosrs:GalacticCoordinateSystem

**Table 50 – 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 51 – geosrs:HorizontalCoordinateSystem**

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

### 8.2.6. Class: geosrs:PerifocalCoordinateSystem

**Table 52 – geosrs:PerifocalCoordinateSystem**

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

### 8.2.7. Class: geosrs:SuperGalacticCS

**Table 53 – geosrs:SuperGalacticCS**

URI	<a href="https://w3id.org/geosrs/cs/SuperGalacticCS">https://w3id.org/geosrs/cs/SuperGalacticCS</a>
Definition	A reference frame for the supercluster of galaxies that contains the Milky Way galaxy, referenced to a local

	relatively flat collection of galaxy clusters used to define the supergalactic plane.
Super-classes	<a href="#">CelestialCoordinateSystem</a> <a href="#">3DCoordinateSystem</a>

## 8.3. Coordinate System Components

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### REQUIREMENT 10: COORDINATE SYSTEM COMPONENTS

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

## 8.4. Coordinate System Properties

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### REQUIREMENT 11: COORDINATE SYSTEM PROPERTIES

IDENTIFIER	/req/cs/Coordinate_System_Properties
STATEMENT	Implementations shall allow the RDFS properties geosrs:axis, geosrs:axisDirection to be used in SPARQL graph patterns.

### 8.4.1. Property: geosrs:axis

Table 54 – geosrs:axis

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

Domain	<a href="#">CoordinateSystem</a>
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## 8.4.2. Property: geosrs:axisDirection

**Table 55 – geosrs:axisDirection**

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

## 8.5. Coordinate System Types

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### REQUIREMENT 12: COORDINATE SYSTEM TYPES

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

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

## 8.5.1. Class: geosrs:AffineCoordinateSystem

**Table 56** – geosrs:AffineCoordinateSystem

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

### 8.5.2. Class: geosrs:BarycentricCoordinateSystem

**Table 57** – geosrs:BarycentricCoordinateSystem

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

### 8.5.3. Class: geosrs:CurvilinearCoordinateSystem

**Table 58** – geosrs:CurvilinearCoordinateSystem

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

### 8.5.4. Class: geosrs:EngineeringCoordinateSystem

**Table 59** – geosrs:EngineeringCoordinateSystem

URI	<a href="https://w3id.org/geosrs/cs/EngineeringCoordinateSystem">https://w3id.org/geosrs/cs/EngineeringCoordinateSystem</a>
Definition	Coordinate system used by an engineering coordinate reference system, one of an affine coordinate system, a Cartesian coordinate system, a cylindrical coordinate

	system, a linear coordinate system, an ordinal coordinate system, a polar coordinate system or a spherical coordinate system
Super-classes	<a href="#">CoordinateSystem</a>

### 8.5.5. Class: geosrs:GeodeticCoordinateSystem

**Table 60** – geosrs:GeodeticCoordinateSystem

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

### 8.5.6. Class: geosrs:GeographicalCoordinateSystem

**Table 61** – geosrs:GeographicalCoordinateSystem

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

### 8.5.7. Class: geosrs:GridCoordinateSystem

**Table 62** – geosrs:GridCoordinateSystem

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

## 8.5.8. Class: geosrs:HexagonalCoordinateSystem

**Table 63** – geosrs:HexagonalCoordinateSystem

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

## 8.5.9. Class: geosrs:LocalCoordinateSystem

**Table 64** – geosrs:LocalCoordinateSystem

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

## 8.5.10. Class: geosrs:ObliqueCoordinateSystem

**Table 65** – geosrs:ObliqueCoordinateSystem

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

## 8.5.11. Class: geosrs:OrthogonalCoordinateSystem

**Table 66** – geosrs:OrthogonalCoordinateSystem

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

## 8.5.12. Class: geosrs:PlanarCoordinateSystem

**Table 67 – geosrs:PlanarCoordinateSystem**

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

## 8.6. Temporal Coordinate Systems

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### REQUIREMENT 13: TEMPORAL COORDINATE SYSTEMS

IDENTIFIER	/req/cs/Temporal_Coordinate_Systems
STATEMENT	Implementations shall allow the RDFS classes geosrs:1DCoordinateSystem, geosrs:Date TimeTemporalCoordinateSystem, geosrs:TemporalCountCoordinateSystem, geosrs:Temporal CoordinateSystem, geosrs:TemporalMeasureCoordinateSystem to be used in SPARQL graph patterns.

## 8.6.1. Class: geosrs:1DCoordinateSystem

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

**Table 68** – geosrs:1DCoordinateSystem

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

### 8.6.2. Class: geosrs:DateTimeTemporalCoordinateSystem

**Table 69** – 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 dateTime representation as defined in ISO 8601.
Super-classes	<a href="#">TemporalCoordinateSystem</a>

### 8.6.3. Class: geosrs:TemporalCountCoordinateSystem

**Table 70** – geosrs:TemporalCountCoordinateSystem

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

### 8.6.4. Class: geosrs:TemporalCoordinateSystem

**Table 71** – geosrs:TemporalCoordinateSystem

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

## 8.6.5. Class: geosrs:TemporalMeasureCoordinateSystem

**Table 72 – geosrs:TemporalMeasureCoordinateSystem**

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

9

# DATUM MODULE

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# DATUM MODULE

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



Figure 4

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

IDENTIFIER	/req/datum
TARGET TYPE	Implementation Specification
CONFORMANCE CLASS	Conformance class A.4: /conf/datum
REQUIREMENT	<ul style="list-style-type: none"> <li>/req/datum/Datum_Types</li> <li>/req/datum/Datum_Parameters</li> <li>/req/datum/Spheroid_Types</li> <li>/req/datum/Spheroid_Properties</li> </ul>

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

/req/datum/Datum\_Properties

### 9.1. Datum Parameters

#### REQUIREMENT 14: DATUM PARAMETERS

**IDENTIFIER** /req/datum/Datum\_Parameters

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

#### 9.1.1. Class: geosrs:DefiningParameter

**Table 73 – 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 parametric datum. Cf. ISO 19111:2019 Geographic information — Referencing by coordinates.

### 9.2. Datum Properties

#### REQUIREMENT 15: DATUM PROPERTIES

**IDENTIFIER** /req/datum/Datum\_Properties

**STATEMENT** Implementations shall allow the RDFS properties geosrs:datumDefiningParameter, geosrs:ellipsoid, geosrs:primeMeridian to be used in SPARQL graph patterns.

### 9.2.1. Property: geosrs:datumDefiningParameter

**Table 74** – geosrs:datumDefiningParameter

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

### 9.2.2. Property: geosrs:ellipsoid

**Table 75** – geosrs:ellipsoid

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

### 9.2.3. Property: geosrs:primeMeridian

**Table 76** – geosrs:primeMeridian

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

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

## 9.3. Datum Types

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### REQUIREMENT 16: DATUM TYPES

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

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

### 9.3.1. Class: `geosrs:DynamicGeodeticReferenceFrame`

**Table 77 – `geosrs:DynamicGeodeticReferenceFrame`**

URI	<a href="https://w3id.org/geosrs/datum/&lt;br/&gt;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="#">GeodeticDatum</a>

### 9.3.2. Class: `geosrs:DynamicVerticalDatum`

**Table 78** – 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="#">VerticalDatum</a>
Example	<a href="#">geosrs:DynamicVerticalDatum</a>

### 9.3.3. Class: geosrs:ParametricDatum

**Table 79** – geosrs:ParametricDatum

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

### 9.3.4. Class: geosrs:EngineeringDatum

**Table 80** – geosrs:EngineeringDatum

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

### 9.3.5. Class: geosrs:TemporalDatum

**Table 81** – geosrs:TemporalDatum

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

### 9.3.6. Class: geosrs:DatumEnsemble

**Table 82** – 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

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### REQUIREMENT 17: SPHEROID PROPERTIES

**IDENTIFIER** /req/datum/Spheroid\_Properties

**STATEMENT** Implementations shall allow the RDFS properties geosrs:eccentricity, geosrs:inverseFlattening, geosrs:isSphere, geosrs:semiMajorAxis, geosrs:semiMinorAxis to be used in SPARQL graph patterns.

### 9.4.1. Property: geosrs:eccentricity

**Table 83** – geosrs:eccentricity

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

### 9.4.2. Property: geosrs:inverseFlattening

**Table 84** – geosrs:inverseFlattening

URI	<a href="https://w3id.org/geosrs/datum/inverseFlattening">https://w3id.org/geosrs/datum/inverseFlattening</a>
Type	<a href="#">owl:DatatypeProperty</a>
Definition	Indicates the inverse flattening value of an ellipsoid, expressed as a number or a ratio (percentage rate, parts per million, etc.). Cf. ISO 19111:2007:2007-07, table 37, attribute inverse flattening
Range	<a href="#">xsd:double</a>
Domain	<a href="#">Ellipsoid</a>
Example	<a href="#">geosrs:inverseFlattening</a>

### 9.4.3. Property: geosrs:isSphere

**Table 85 – geosrs:isSphere**

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

#### 9.4.4. Property: geosrs:semiMajorAxis

**Table 86 – geosrs:semiMajorAxis**

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

#### 9.4.5. Property: geosrs:semiMinorAxis

**Table 87 – geosrs:semiMinorAxis**

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

Definition	Indicates the length of the semi minor axis of an ellipsoid. Cf. ISO 19111:2007:2007-07, table 37, attribute length of semi-minor axis.
Range	<u>xsd:double</u>
Domain	<u>Ellipsoid</u>
Example	<u>geosrs:semiMinorAxis</u>

## 9.5. Spheroid Types

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### REQUIREMENT 18: SPHEROID TYPES

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

### 9.5.1. Class: geosrs:TriaxialEllipsoid

**Table 88** – 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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# SRS APPLICATION MODULE

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



Figure 5

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

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

## 10.1. Map Types

### REQUIREMENT 19: MAP TYPES

**IDENTIFIER** /req/srsapplication/Map\_Types

**STATEMENT** Implementations shall allow the RDFS classes geosrs:CadastreMap, geosrs:NauticalChart, geosrs:ThematicMap, geosrs:TopographicMap, geosrs:WeatherMap to be used in SPARQL graph patterns.

### 10.1.1. Class: geosrs:CadastreMap

**Table 89** – geosrs:CadastreMap

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

### 10.1.2. Class: geosrs:NauticalChart

**Table 90** – geosrs:NauticalChart

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

### 10.1.3. Class: geosrs:ThematicMap

**Table 91** – geosrs:ThematicMap

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

### 10.1.4. Class: geosrs:TopographicMap

**Table 92 – geosrs:TopographicMap**

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

### 10.1.5. Class: geosrs:WeatherMap

**Table 93 – geosrs:WeatherMap**

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

## 10.2. SRS Application Types

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### REQUIREMENT 20: SRS APPLICATION TYPES

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

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

### 10.2.1. Class: geosrs:SRSApplication

**Table 94 – geosrs:SRSApplication**

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

### 10.2.2. Class: geosrs:SpatialReferencing

**Table 95 – geosrs:SpatialReferencing**

URI	<a href="https://w3id.org/geosrs/application/SpatialReferencing">https://w3id.org/geosrs/application/SpatialReferencing</a>
Definition	Spatial referencing is the process of assigning real-world coordinates to data so that it can be located on the Earth's surface and used in a geographic information system (GIS).
Super-classes	<a href="#">SRSApplication</a>

### 10.2.3. Class: geosrs:EngineeringSurvey

**Table 96 – geosrs:EngineeringSurvey**

URI	<a href="https://w3id.org/geosrs/application/EngineeringSurvey">https://w3id.org/geosrs/application/EngineeringSurvey</a>
Definition	An engineering survey is the branch of surveying that provides the precise measurements and data needed to plan, build, and maintain engineering and infrastructure projects.
Super-classes	<a href="#">SRSApplication</a>
Example	<a href="#">geosrs:EngineeringSurvey</a>

### 10.2.4. Class: geosrs:SatelliteSurvey

**Table 97 – geosrs:SatelliteSurvey**

URI	<a href="https://w3id.org/geosrs/application/SatelliteSurvey">https://w3id.org/geosrs/application/SatelliteSurvey</a>
Definition	A remote sensing survey conducted from Earth-orbiting satellites, collecting imagery and other data without direct ground contact.
Super-classes	<a href="#">SRSApplication</a>

### 10.2.5. Class: geosrs:SatelliteNavigation

**Table 98 – geosrs:SatelliteNavigation**

URI	<a href="https://w3id.org/geosrs/application/SatelliteNavigation">https://w3id.org/geosrs/application/SatelliteNavigation</a>
Definition	Satellite navigation is a system that uses satellites to provide autonomous geo-spatial positioning. It allows small electronic receivers to determine their location (longitude, latitude, and altitude) to high precision using time signals transmitted along a line of sight by radio from satellites.
Super-classes	<a href="#">SRSApplication</a>

### 10.2.6. Class: geosrs:CoastalHydrography

**Table 99 – geosrs:CoastalHydrography**

URI	<a href="https://w3id.org/geosrs/application/CoastalHydrography">https://w3id.org/geosrs/application/CoastalHydrography</a>
Definition	Hydrographic surveying & monitoring focused on nearshore waters, where navigation safety and coastal change are most critical.
Super-classes	<a href="#">Hydrography</a>
Example	<a href="#">geosrs:CoastalHydrography</a>

### 10.2.7. Class: geosrs:OffshoreEngineering

**Table 100 – geosrs:OffshoreEngineering**

URI	<a href="https://w3id.org/geosrs/application/OffshoreEngineering">https://w3id.org/geosrs/application/OffshoreEngineering</a>
Definition	Offshore engineering (also called ocean engineering or marine engineering in some contexts) is the branch of engineering concerned with the design, construction, installation, and maintenance of structures and systems in the ocean environment, such as oil and gas platforms, subsea pipelines, and renewable energy facilities.
Super-classes	<a href="#">SRSApplication</a>
Example	<a href="#">geosrs:OffshoreEngineering</a>

## 10.2.8. Class: geosrs:Hydrography

**Table 101 – geosrs:Hydrography**

URI	<a href="https://w3id.org/geosrs/application/Hydrography">https://w3id.org/geosrs/application/Hydrography</a>
Definition	Hydrography is the branch of applied sciences which deals with the measurement and description of the physical features of oceans, seas, coastal areas, lakes, and rivers, as well as the prediction of their change over time, for the primary purpose of safety of navigation and in support of all other marine activities, including economic development, security and defense, scientific research, and environmental protection.
Super-classes	<a href="#">SRSApplication</a>
Example	<a href="#">geosrs:Hydrography</a>

## 10.2.9. Class: geosrs:Drilling

**Table 102 – geosrs:Drilling**

URI	<a href="https://w3id.org/geosrs/application/Drilling">https://w3id.org/geosrs/application/Drilling</a>
Definition	Drilling is the process of creating holes in the ground (or other solid materials) using specialized tools, widely applied in energy, construction, mining, and manufacturing.

Super-classes	<a href="#">SRSApplication</a>
Example	<a href="#">geosrs:Drilling</a>

## 10.2.10. Class: geosrs:OilAndGasExploration

**Table 103 – geosrs:OilAndGasExploration**

URI	<a href="https://w3id.org/geosrs/application/&lt;br/&gt;OilAndGasExploration">https://w3id.org/geosrs/application/ OilAndGasExploration</a>
Definition	Oil and natural gas exploration is the search for underground or underwater reservoirs containing hydrocarbons, using geological and geophysical methods, followed by drilling to confirm and produce them.
Super-classes	<a href="#">SRSApplication</a>

11

# PROJECTIONS MODULE

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

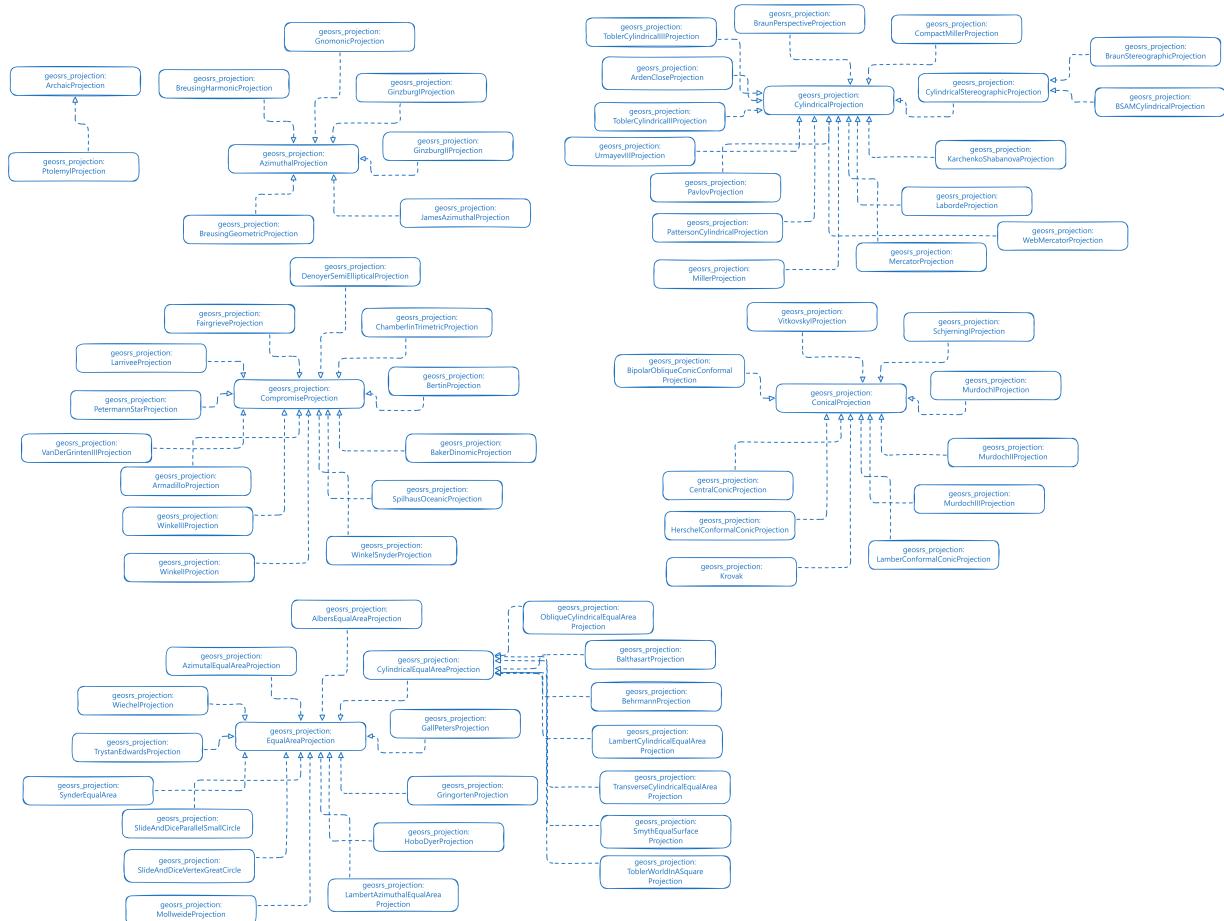


Figure 6

REQUIREMENTS CLASS 6: 11-PROJECTIONS_MODULE.ADOC EXTENSION	
IDENTIFIER	/req/projections
TARGET TYPE	Implementation Specification
CONFORMANCE CLASS	Conformance class A.6: /conf/projections
REQUIREMENT	/req/projections/Lenticular_Projections /req/projections/Conformal_Projections

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

/req/projections/Minimum\_Error\_Projections

/req/projections/Pseudo\_Azimuthal\_Projections

/req/projections/Equal\_Area\_Projections

/req/projections/Pseudo\_Conical\_Projections

/req/projections/Globular\_Projections

/req/projections/Pseudo\_Cylindrical\_Projections

/req/projections/Archaic\_Projections

/req/projections/Cylindrical\_Projections

/req/projections/Compromise\_Projections

/req/projections/Polyhedral\_Projections

/req/projections/Equidistant\_Projections

/req/projections/Azimuthal\_Projections

/req/projections/Conical\_Projections

/req/projections/Perspective\_Projections

/req/projections/Stereographic\_Projections

/req/projections/Polyconic\_Projections

/req/projections/Projection

### 11.1. Archaic Projections

#### REQUIREMENT 21: ARCHAIC PROJECTIONS

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

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

### 11.1.1. Class: geosrs:ArchaicProjection

**Table 104** – geosrs:ArchaicProjection

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

**Table 105** – geosrs:PtolemyIProjection

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

## 11.2. Azimuthal Projections

### REQUIREMENT 22: AZIMUTHAL PROJECTIONS

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

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

### 11.2.1. Class: geosrs:AzimuthalProjection

**Table 106** – geosrs:AzimuthalProjection

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

**Table 107 – geosrs:BreusingGeometricProjection**

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

### 11.2.3. Class: geosrs:BreusingHarmonicProjection

**Table 108 – geosrs:BreusingHarmonicProjection**

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

### 11.2.4. Class: geosrs:GinzburgIIProjection

**Table 109 – geosrs:GinzburgIIProjection**

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

### 11.2.5. Class: geosrs:GinzburgIProjection

**Table 110 – geosrs:GinzburgIProjection**

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

### 11.2.6. Class: geosrs:GnomonicProjection

**Table 111 – geosrs:GnomonicProjection**

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

## 11.2.7. Class: geosrs:JamesAzimuthalProjection

**Table 112** – geosrs:JamesAzimuthalProjection

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

## 11.3. Compromise Projections

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### REQUIREMENT 23: COMPROMISE PROJECTIONS

IDENTIFIER /req/projections/Compromise\_Projections

STATEMENT Implementations shall allow the RDFS classes geosrs:ArmadilloProjection, geosrs:BakerDinomicProjection, geosrs:BertinProjection, geosrs:ChamberlinTrimetricProjection, geosrs:DenoyerSemiEllipticalProjection, geosrs:FairgrieveProjection, geosrs:LarriveeProjection, geosrs:PetermannStarProjection, geosrs:SpilhausOceanicProjection, geosrs:VanDerGrintenIIIProjection, geosrs:WinkelIIProjection, geosrs:WinkellProjection, geosrs:WinkelSnyderProjection to be used in SPARQL graph patterns.

### 11.3.1. Class: geosrs:ArmadilloProjection

**Table 113** – geosrs:ArmadilloProjection

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

### 11.3.2. Class: geosrs:BakerDinomicProjection

**Table 114** – geosrs:BakerDinomicProjection

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

**Table 115** – geosrs:BertinProjection

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

### 11.3.4. Class: geosrs:ChamberlinTrimetricProjection

**Table 116** – geosrs:ChamberlinTrimetricProjection

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

### 11.3.5. Class: geosrs:DenoyerSemiEllipticalProjection

**Table 117** – geosrs:DenoyerSemiEllipticalProjection

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

### 11.3.6. Class: geosrs:FairgrieveProjection

**Table 118** – geosrs:FairgrieveProjection

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

### 11.3.7. Class: geosrs:LarriveeProjection

**Table 119** – geosrs:LarriveeProjection

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

### 11.3.8. Class: geosrs:PetermannStarProjection

**Table 120** – geosrs:PetermannStarProjection

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

### 11.3.9. Class: geosrs:SpilhausOceanicProjection

**Table 121** – geosrs:SpilhausOceanicProjection

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

### 11.3.10. Class: geosrs:VanDerGrintenIIIProjection

**Table 122** – geosrs:VanDerGrintenIIIProjection

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

### 11.3.11. Class: geosrs:WinkelIIIProjection

**Table 123 – geosrs:WinkelIIProjection**

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

### 11.3.12. Class: geosrs:WinkelIIProjection

**Table 124 – geosrs:WinkelIIProjection**

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

### 11.3.13. Class: geosrs:WinkelSnyderProjection

**Table 125 – geosrs:WinkelSnyderProjection**

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

## 11.4. Conformal Projections

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### REQUIREMENT 24: CONFORMAL PROJECTIONS

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

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

### 11.4.1. Class: geosrs:AdamsProjection

**Table 126** – geosrs:AdamsProjection

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

### 11.4.2. Class: geosrs:AdamsWorldInASquareIIProjection

**Table 127** – geosrs:AdamsWorldInASquareIIProjection

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

### 11.4.3. Class: geosrs:AdamsWorldInASquareIProjection

**Table 128** – geosrs:AdamsWorldInASquareIProjection

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

### 11.4.4. Class: geosrs:AugustEpicycloidalProjection

**Table 129** – geosrs:AugustEpicycloidalProjection

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

## 11.4.5. Class: geosrs:CoxConformalProjection

**Table 130** – geosrs:CoxConformalProjection

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

## 11.4.6. Class: geosrs:EisenlohrProjection

**Table 131** – geosrs:EisenlohrProjection

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

## 11.4.7. Class: geosrs:GS50Projection

**Table 132** – geosrs:GS50Projection

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

## 11.4.8. Class: geosrs:PeirceQuincuncialProjection

**Table 133** – geosrs:PeirceQuincuncialProjection

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

## 11.4.9. Class: geosrs:StereographicProjection

**Table 134 – geosrs:StereographicProjection**

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

## 11.5. Conical Projections

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### REQUIREMENT 25: CONICAL PROJECTIONS

**IDENTIFIER** /req/projections/Conical\_Projections

**STATEMENT** Implementations shall allow the RDFS classes geosrs:BipolarObliqueConicConformalProjection, geosrs:CentralConicProjection, geosrs:HerschelConformalConicProjection, geosrs:Krovak, geosrs:LambertConformalConicProjection, geosrs:MurdochIIIProjection, geosrs:MurdochIIProjection, geosrs:MurdochIProjection, geosrs:SchjerningIProjection, geosrs:VitkovskyIProjection to be used in SPARQL graph patterns.

### 11.5.1. Class: geosrs:BipolarObliqueConicConformalProjection

**Table 135 – geosrs:BipolarObliqueConicConformalProjection**

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

### 11.5.2. Class: geosrs:CentralConicProjection

**Table 136 – geosrs:CentralConicProjection**

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

### 11.5.3. Class: geosrs:HerschelConformalConicProjection

**Table 137** – geosrs:HerschelConformalConicProjection

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

### 11.5.4. Class: geosrs:Krovak

**Table 138** – geosrs:Krovak

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

### 11.5.5. Class: geosrs:LambertConformalConicProjection

**Table 139** – geosrs:LambertConformalConicProjection

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

### 11.5.6. Class: geosrs:MurdochIIIProjection

**Table 140** – geosrs:MurdochIIIProjection

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

## 11.5.7. Class: geosrs:MurdochIIProjection

**Table 141** – geosrs:MurdochIIProjection

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

## 11.5.8. Class: geosrs:MurdochIProjection

**Table 142** – geosrs:MurdochIProjection

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

## 11.5.9. Class: geosrs:SchjerningIProjection

**Table 143** – geosrs:SchjerningIProjection

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

## 11.5.10. Class: geosrs:VitkovskylProjection

**Table 144** – geosrs:VitkovskylProjection

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

## 11.6. Cylindrical Projections

### REQUIREMENT 26: CYLINDRICAL PROJECTIONS

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

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

### 11.6.1. Class: geosrs:ArdenCloseProjection

**Table 145 – geosrs:ArdenCloseProjection**

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

### 11.6.2. Class: geosrs:BSAMCylindricalProjection

**Table 146 – geosrs:BSAMCylindricalProjection**

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

### 11.6.3. Class: geosrs:BalthasartProjection

**Table 147 – geosrs:BalthasartProjection**

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

## 11.6.4. Class: geosrs:BehrmannProjection

**Table 148** – geosrs:BehrmannProjection

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

## 11.6.5. Class: geosrs:BraunPerspectiveProjection

**Table 149** – geosrs:BraunPerspectiveProjection

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

## 11.6.6. Class: geosrs:BraunStereographicProjection

**Table 150** – geosrs:BraunStereographicProjection

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

## 11.6.7. Class: geosrs:CompactMillerProjection

**Table 151** – geosrs:CompactMillerProjection

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

[CylindricalProjection](#)

### 11.6.8. Class: geosrs:CylindricalProjection

**Table 152** – geosrs:CylindricalProjection

URI

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

### 11.6.9. Class: geosrs:CylindricalStereographicProjection

**Table 153** – geosrs:CylindricalStereographicProjection

URI

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

Super-classes

[CylindricalProjection](#)

### 11.6.10. Class: geosrs:KarchenkoShabanovaProjection

**Table 154** – geosrs:KarchenkoShabanovaProjection

URI

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

Super-classes

[CylindricalProjection](#)

### 11.6.11. Class: geosrs:LabordeProjection

**Table 155** – geosrs:LabordeProjection

URI

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

Super-classes

[CylindricalProjection](#)

Example

[geosrs:LabordeProjection](#)

## 11.6.12. Class: geosrs:MercatorProjection

**Table 156** – geosrs:MercatorProjection

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

## 11.6.13. Class: geosrs:MillerProjection

**Table 157** – geosrs:MillerProjection

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

## 11.6.14. Class: geosrs:PattersonCylindricalProjection

**Table 158** – geosrs:PattersonCylindricalProjection

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

## 11.6.15. Class: geosrs:PavlovProjection

**Table 159** – geosrs:PavlovProjection

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

## 11.6.16. Class: geosrs:ToblerCylindricalIIIProjection

**Table 160** – geosrs:ToblerCylindricalIIIProjection

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

## 11.6.17. Class: geosrs:ToblerCylindricalIIIProjection

**Table 161** – geosrs:ToblerCylindricalIIIProjection

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

## 11.6.18. Class: geosrs:TransverseMercatorProjection

**Table 162** – geosrs:TransverseMercatorProjection

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

## 11.6.19. Class: geosrs:UrmayevIIIProjection

**Table 163** – geosrs:UrmayevIIIProjection

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

## 11.6.20. Class: geosrs:WebMercatorProjection

**Table 164 – geosrs:WebMercatorProjection**

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

## 11.7. Equal Area Projections

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### REQUIREMENT 27: EQUAL AREA PROJECTIONS

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

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

### 11.7.1. Class: geosrs:AlbersEqualAreaProjection

**Table 165 – geosrs:AlbersEqualAreaProjection**

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

### 11.7.2. Class: geosrs:AzimuthalEqualAreaProjection

**Table 166 – geosrs:AzimuthalEqualAreaProjection**

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

[EqualAreaProjection](#)

### 11.7.3. Class: geosrs:CylindricalEqualArea

**Table 167** – geosrs:CylindricalEqualArea

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

### 11.7.4. Class: geosrs:EqualAreaProjection

**Table 168** – geosrs:EqualAreaProjection

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

**Table 169** – geosrs:GallPetersProjection

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

### 11.7.6. Class: geosrs:HoboDyerProjection

**Table 170** – geosrs:HoboDyerProjection

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

### 11.7.7. Class: geosrs:LambertAzimuthalEqualArea

**Table 171** – geosrs:LambertAzimuthalEqualArea

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

### 11.7.8. Class: geosrs:LambertCylindricalEqualAreaProjection

**Table 172** – geosrs:LambertCylindricalEqualAreaProjection

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

### 11.7.9. Class: geosrs:ObliqueCylindricalEqualAreaProjection

**Table 173** – geosrs:ObliqueCylindricalEqualAreaProjection

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

### 11.7.10. Class: geosrs:SlideAndDiceParallelSmallCircle

**Table 174** – geosrs:SlideAndDiceParallelSmallCircle

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

Super-classes	<a href="#">EqualAreaProjection</a>
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### 11.7.11. Class: geosrs:SliceAndDiceVertexGreatCircle

**Table 175 – geosrs:SliceAndDiceVertexGreatCircle**

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

### 11.7.12. Class: geosrs:SmythEqualSurfaceProjection

**Table 176 – geosrs:SmythEqualSurfaceProjection**

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

### 11.7.13. Class: geosrs:SnyderEqualArea

**Table 177 – geosrs:SnyderEqualArea**

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

## 11.7.14. Class: geosrs:ToblerWorldInASquareProjection

**Table 178** – geosrs:ToblerWorldInASquareProjection

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

## 11.7.15. Class: geosrs:TransverseCylindricalEqualAreaProjection

**Table 179** – geosrs:TransverseCylindricalEqualAreaProjection

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

## 11.7.16. Class: geosrs:TrystanEdwardsProjection

**Table 180** – geosrs:TrystanEdwardsProjection

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

## 11.7.17. Class: geosrs:WiechelProjection

**Table 181** – geosrs:WiechelProjection

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

## 11.8. Equidistant Projections

### REQUIREMENT 28: EQUIDISTANT PROJECTIONS

IDENTIFIER	/req/projections/Equidistant_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:AzimuthalEquidistantProjection, geosrs:BerghausStarProjection, geosrs:CassiniProjection, geosrs:EquidistantConicProjection, geosrs:EquidistantCylindricalProjection, geosrs:EquidistantProjection, geosrs:EquirectangularProjection, geosrs:ObliquePlateCarreeProjection, geosrs:PlateCarreeProjection, geosrs:TwoPointEquidistantProjection to be used in SPARQL graph patterns.

#### 11.8.1. Class: geosrs:AzimuthalEquidistantProjection

Table 182 – geosrs:AzimuthalEquidistantProjection

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

#### 11.8.2. Class: geosrs:BerghausStarProjection

Table 183 – geosrs:BerghausStarProjection

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

#### 11.8.3. Class: geosrs:CassiniProjection

Table 184 – geosrs:CassiniProjection

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

## 11.8.4. Class: geosrs:EquidistantConicProjection

**Table 185** – geosrs:EquidistantConicProjection

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

## 11.8.5. Class: geosrs:EquidistantCylindricalProjection

**Table 186** – geosrs:EquidistantCylindricalProjection

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

## 11.8.6. Class: geosrs:EquidistantProjection

**Table 187** – geosrs:EquidistantProjection

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

**Table 188** – geosrs:EquirectangularProjection

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

**Table 189** – geosrs:ObliquePlateCarreeProjection

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

## 11.8.9. Class: geosrs:PlateCarreeProjection

**Table 190** – geosrs:PlateCarreeProjection

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

## 11.8.10. Class: geosrs:TwoPointEquidistantProjection

**Table 191** – geosrs:TwoPointEquidistantProjection

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

## 11.9. Globular Projections

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### REQUIREMENT 29: GLOBULAR PROJECTIONS

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

### 11.9.1. Class: geosrs:ApianGlobularIProjection

**Table 192** – geosrs:ApianGlobularIProjection

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

### 11.9.2. Class: geosrs:BaconGlobularProjection

**Table 193** – geosrs:BaconGlobularProjection

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

### 11.9.3. Class: geosrs:FournierGlobularIProjection

**Table 194** – geosrs:FournierGlobularIProjection

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

## 11.10. Lenticular Projections

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### REQUIREMENT 30: LENTICULAR PROJECTIONS

**IDENTIFIER** /req/projections/Lenticular\_Projections

**STATEMENT** Implementations shall allow the RDFS classes geosrs:A4Projection, geosrs:BriesemeisterProjection, geosrs:CiriciProjection, geosrs:CupolaProjection, geosrs:DedistortProjection, geosrs:DietrichKitadaProjection, geosrs:FranculaIIIProjection, geosrs:FranculaVProjection, geosrs:FranculaXProjection, geosrs:FranculaVIIIProjection, geosrs:FranculaVProjection, geosrs:FranculaXIIIProjection, geosrs:

## REQUIREMENT 30: LENTICULAR PROJECTIONS

FranculaXIIProjection, geosrs:FranculaXIVProjection, geosrs:HamusoidalProjection, geosrs:Kiss  
Projection to be used in SPARQL graph patterns.

### 11.10.1. Class: geosrs:A4Projection

**Table 195** – geosrs:A4Projection

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

### 11.10.2. Class: geosrs:BriesemeisterProjection

**Table 196** – geosrs:BriesemeisterProjection

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

### 11.10.3. Class: geosrs:CircIProjection

**Table 197** – geosrs:CircIProjection

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

### 11.10.4. Class: geosrs:CupolaProjection

**Table 198** – geosrs:CupolaProjection

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

## 11.10.5. Class: geosrs:DedistortProjection

**Table 199** – geosrs:DedistortProjection

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

## 11.10.6. Class: geosrs:DietrichKitadaProjection

**Table 200** – geosrs:DietrichKitadaProjection

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

## 11.10.7. Class: geosrs:FranculallIIProjection

**Table 201** – geosrs:FranculallIIProjection

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

## 11.10.8. Class: geosrs:FranculalVProjection

**Table 202** – geosrs:FranculalVProjection

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

## 11.10.9. Class: geosrs:FranculalXProjection

**Table 203 – geosrs:FranculaIXProjection**

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

### 11.10.10. Class: geosrs:FranculaVIIIProjection

**Table 204 – geosrs:FranculaVIIIProjection**

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

### 11.10.11. Class: geosrs:FranculaVProjection

**Table 205 – geosrs:FranculaVProjection**

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

### 11.10.12. Class: geosrs:FranculaXIIIProjection

**Table 206 – geosrs:FranculaXIIIProjection**

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

### 11.10.13. Class: geosrs:FranculaXIIProjection

**Table 207 – geosrs:FranculaXIIProjection**

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

## 11.10.14. Class: geosrs:FranculaXIVProjection

**Table 208** – geosrs:FranculaXIVProjection

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

## 11.10.15. Class: geosrs:HamusoidalProjection

**Table 209** – geosrs:HamusoidalProjection

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

## 11.10.16. Class: geosrs:KissProjection

**Table 210** – geosrs:KissProjection

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

## 11.11. Minimum Error Projections

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### REQUIREMENT 31: MINIMUM ERROR PROJECTIONS

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

### 11.11.1. Class: geosrs:AiryProjection

**Table 211** – geosrs:AiryProjection

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

## 11.12. Perspective Projections

### REQUIREMENT 32: PERSPECTIVE PROJECTIONS

**IDENTIFIER** /req/projections/Perspective\_Projections

**STATEMENT** Implementations shall allow the RDFS classes geosrs:CentralCylindricalProjection, geosrs:GeneralVerticalPerspectiveProjection, geosrs:GilbertTwoWorldPerspectiveProjection, geosrs:LaHireProjection, geosrs:LorgnaProjection, geosrs:LowryProjection, geosrs:OrthographicProjection, geosrs:PerspectiveConicProjection, geosrs:PerspectiveProjection, geosrs:TiltedPerspectiveProjection, geosrs:VerticalPerspectiveProjection to be used in SPARQL graph patterns.

### 11.12.1. Class: geosrs:CentralCylindricalProjection

**Table 212** – geosrs:CentralCylindricalProjection

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

## 11.12.2. Class: geosrs:GeneralVerticalPerspectiveProjection

**Table 213** – geosrs:GeneralVerticalPerspectiveProjection

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

## 11.12.3. Class: geosrs:GilbertTwoWorldPerspectiveProjection

**Table 214** – geosrs:GilbertTwoWorldPerspectiveProjection

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

## 11.12.4. Class: geosrs:LaHireProjection

**Table 215** – geosrs:LaHireProjection

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

## 11.12.5. Class: geosrs:LorgnaProjection

**Table 216** – geosrs:LorgnaProjection

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

## 11.12.6. Class: geosrs:LowryProjection

**Table 217** – geosrs:LowryProjection

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

### 11.12.7. Class: geosrs:OrthographicProjection

**Table 218** – geosrs:OrthographicProjection

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

### 11.12.8. Class: geosrs:PerspectiveConicProjection

**Table 219** – geosrs:PerspectiveConicProjection

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

### 11.12.9. Class: geosrs:PerspectiveProjection

**Table 220** – geosrs:PerspectiveProjection

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

**Table 221** – geosrs:TiltedPerspectiveProjection

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

## 11.12.11. Class: geosrs:VerticalPerspectiveProjection

**Table 222** – geosrs:VerticalPerspectiveProjection

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

## 11.13. Polyconic Projections

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### REQUIREMENT 33: POLYCONIC PROJECTIONS

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

**STATEMENT** Implementations shall allow the RDFS classes geosrs:GinzburgIVProjection, geosrs:GinzburgIXProjection, geosrs:GinzburgVIPProjection, geosrs:GinzburgVProjection, geosrs:GinzburgVProjection, geosrs:GottWagnerProjection, geosrs:HillEucyclicProjection, geosrs:LagrangeProjection, geosrs:LaskowskiProjection, geosrs:PolyconicProjection, geosrs:RectangularPolyconicProjection, geosrs:StabiusWernerIIIProjection, geosrs:StabiusWernerIIProjection, geosrs:VanDerGrintenIIProjection, geosrs:VanDerGrintenIIProjection, geosrs:VanDerGrintenIVProjection, geosrs:VanDerGrintenIVProjection, geosrs:WagnerIXProjection, geosrs:WagnerVIIIProjection, geosrs:WagnerVIIProjection to be used in SPARQL graph patterns.

## 11.13.1. Class: geosrs:GinzburgIVProjection

**Table 223** – geosrs:GinzburgIVProjection

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

## 11.13.2. Class: geosrs:GinzburgIXProjection

**Table 224** – geosrs:GinzburgIXProjection

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

[PolyconicProjection](#)

### 11.13.3. Class: geosrs:GinzburgVIProjection

**Table 225** – geosrs:GinzburgVIProjection

URI

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

Super-classes

[PolyconicProjection](#)

### 11.13.4. Class: geosrs:GinzburgVProjection

**Table 226** – geosrs:GinzburgVProjection

URI

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

Super-classes

[PolyconicProjection](#)

### 11.13.5. Class: geosrs:GottWagnerProjection

**Table 227** – geosrs:GottWagnerProjection

URI

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

Super-classes

[PolyconicProjection](#)

### 11.13.6. Class: geosrs:HillEucyclicProjection

**Table 228** – geosrs:HillEucyclicProjection

URI

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

Super-classes

[PolyconicProjection](#)

## 11.13.7. Class: geosrs:LagrangeProjection

**Table 229** – geosrs:LagrangeProjection

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

## 11.13.8. Class: geosrs:LaskowskiProjection

**Table 230** – geosrs:LaskowskiProjection

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

## 11.13.9. Class: geosrs:PolyconicProjection

**Table 231** – geosrs:PolyconicProjection

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

**Table 232** – geosrs:RectangularPolyconicProjection

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

## 11.13.11. Class: geosrs:StabiusWernerIIIProjection

**Table 233 – geosrs:StabiusWernerIIIProjection**

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

### 11.13.12. Class: geosrs:StabiusWernerIProjection

**Table 234 – geosrs:StabiusWernerIProjection**

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

### 11.13.13. Class: geosrs:VanDerGrintenIIProjection

**Table 235 – geosrs:VanDerGrintenIIProjection**

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

### 11.13.14. Class: geosrs:VanDerGrintenIProjection

**Table 236 – geosrs:VanDerGrintenIProjection**

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

### 11.13.15. Class: geosrs:VanDerGrintenIVProjection

**Table 237 – geosrs:VanDerGrintenIVProjection**

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

[PolyconicProjection](#)

### 11.13.16. Class: geosrs:WagnerIXProjection

**Table 238** – geosrs:WagnerIXProjection

URI

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

Super-classes

[PolyconicProjection](#)

### 11.13.17. Class: geosrs:WagnerVIIIProjection

**Table 239** – geosrs:WagnerVIIIProjection

URI

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

Super-classes

[PolyconicProjection](#)

### 11.13.18. Class: geosrs:WagnerVIIProjection

**Table 240** – geosrs:WagnerVIIProjection

URI

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

Super-classes

[PolyconicProjection](#)

## 11.14. Polyhedral Projections

### REQUIREMENT 34: POLYHEDRAL PROJECTIONS

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

**STATEMENT** Implementations shall allow the RDFS classes geosrs:AuthaGraphProjection, geosrs:CahillKeyesProjection, geosrs:CollignonButterflyProjection, geosrs:DodecahedralProjection, geosrs:DymaxionProjection, geosrs:GnomonicButterflyProjection, geosrs:GnomonicCubedSphereProjection, geosrs:

## REQUIREMENT 34: POLYHEDRAL PROJECTIONS

GnomonicicosahedronProjection, geosrs:GuyouProjection, geosrs:IcosahedralProjection, geosrs:LeeProjection, geosrs:MyrahedralProjection, geosrs:OctantProjection, geosrs:PolyhedralProjection, geosrs:QuadrilateralizedSphericalCubeProjection, geosrs:WatermanButterflyProjection to be used in SPARQL graph patterns.

### 11.14.1. Class: geosrs:AuthaGraphProjection

**Table 241** – geosrs:AuthaGraphProjection

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

### 11.14.2. Class: geosrs:CahillKeyesProjection

**Table 242** – geosrs:CahillKeyesProjection

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

### 11.14.3. Class: geosrs:CollignonButterflyProjection

**Table 243** – geosrs:CollignonButterflyProjection

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

### 11.14.4. Class: geosrs:DodecahedralProjection

**Table 244** – geosrs:DodecahedralProjection

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

[PolyhedralProjection](#)

### 11.14.5. Class: geosrs:DymaxionProjection

**Table 245** – geosrs:DymaxionProjection

URI

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

Super-classes

[PolyhedralProjection](#)

### 11.14.6. Class: geosrs:GnomonicButterflyProjection

**Table 246** – geosrs:GnomonicButterflyProjection

URI

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

Super-classes

[PolyhedralProjection](#)

### 11.14.7. Class: geosrs:GnomonicCubedSphereProjection

**Table 247** – geosrs:GnomonicCubedSphereProjection

URI

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

Super-classes

[PolyhedralProjection](#)

### 11.14.8. Class: geosrs:GnomonicIcosahedronProjection

**Table 248** – geosrs:GnomonicIcosahedronProjection

URI

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

Super-classes

[PolyhedralProjection](#)

## 11.14.9. Class: geosrs:GuyouProjection

**Table 249** – geosrs:GuyouProjection

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

## 11.14.10. Class: geosrs:IcosahedralProjection

**Table 250** – geosrs:IcosahedralProjection

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

## 11.14.11. Class: geosrs:LeeProjection

**Table 251** – geosrs:LeeProjection

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

## 11.14.12. Class: geosrs:MyrahedalProjection

**Table 252** – geosrs:MyrahedalProjection

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

## 11.14.13. Class: geosrs:OctantProjection

**Table 253 – geosrs:OctantProjection**

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

#### 11.14.14. Class: geosrs:PolyhedralProjection

**Table 254 – geosrs:PolyhedralProjection**

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

**Table 255 – geosrs:QuadrilateralizedSphericalCubeProjection**

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

#### 11.14.16. Class: geosrs:WatermanButterflyProjection

**Table 256 – geosrs:WatermanButterflyProjection**

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

### 11.15. Projection

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#### REQUIREMENT 35: PROJECTION

IDENTIFIER /req/projections/Projection

## REQUIREMENT 35: PROJECTION

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

Table 257 – geosrs:Projection

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

## 11.16. Pseudo Azimuthal Projections

### REQUIREMENT 36: PSEUDO AZIMUTHAL PROJECTIONS

IDENTIFIER	/req/projections/Pseudo_Azimuthal_Projections
STATEMENT	Implementations shall allow the RDFS classes geosrs:AitoffObliqueProjection, geosrs:AitoffProjection, geosrs:BartholomewProjection, geosrs:HammerProjection, geosrs:PseudoAzimuthalProjection, geosrs:Strebe1995Projection, geosrs:WinkelTripelProjection to be used in SPARQL graph patterns.

### 11.16.1. Class: geosrs:AitoffObliqueProjection

Table 258 – geosrs:AitoffObliqueProjection

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

### 11.16.2. Class: geosrs:AitoffProjection

**Table 259 – geosrs:AitoffProjection**

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

### 11.16.3. Class: geosrs:BartholomewProjection

**Table 260 – geosrs:BartholomewProjection**

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

### 11.16.4. Class: geosrs:HammerProjection

**Table 261 – geosrs:HammerProjection**

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

### 11.16.5. Class: geosrs:PseudoAzimuthalProjection

**Table 262 – geosrs:PseudoAzimuthalProjection**

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

**Table 263 – geosrs:Strebe1995Projection**

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

[PseudoAzimuthalProjection](#)

### 11.16.7. Class: geosrs:WinkelTripelProjection

**Table 264 – geosrs:WinkelTripelProjection**

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

## 11.17. Pseudo Conical Projections

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### REQUIREMENT 37: PSEUDO CONICAL PROJECTIONS

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

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

### 11.17.1. Class: geosrs:AmericanPolyconicProjection

**Table 265 – geosrs:AmericanPolyconicProjection**

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

### 11.17.2. Class: geosrs:BonneProjection

**Table 266** – geosrs:BonneProjection

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

### 11.17.3. Class: geosrs:BottomleyProjection

**Table 267** – geosrs:BottomleyProjection

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

### 11.17.4. Class: geosrs:NicolosiGlobularProjection

**Table 268** – geosrs:NicolosiGlobularProjection

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

### 11.17.5. Class: geosrs:PseudoConicalProjection

**Table 269** – geosrs:PseudoConicalProjection

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

**Table 270** – geosrs:PtolemyIIProjection

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

## 11.17.7. Class: geosrs:StabiusWernerIIProjection

**Table 271** – geosrs:StabiusWernerIIProjection

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

## 11.17.8. Class: geosrs:WernerProjection

**Table 272** – geosrs:WernerProjection

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

## 11.18. Pseudo Cylindrical Projections

### REQUIREMENT 38: PSEUDO CYLINDRICAL PROJECTIONS

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

**STATEMENT** Implementations shall allow the RDFS classes geosrs:ApianIIProjection, geosrs:AtlantisProjection, geosrs:BaranyilllProjection, geosrs:BaranyillProjection, geosrs:BaranyilProjection, geosrs:BaranyiIVProjection, geosrs:BoggsEumorphicProjection, geosrs:BromleyProjection, geosrs:CabotProjection, geosrs:CollignonProjection, geosrs:CrasterParabolicProjection, geosrs:DeakinMinimumErrorProjection, geosrs:Eckert1Projection, geosrs:Eckert2Projection, geosrs:Eckert3Projection, geosrs:Eckert4Projection, geosrs:Eckert5Projection, geosrs:Eckert6Projection, geosrs:EqualEarthProjection, geosrs:FaheyProjection, geosrs:FoucautProjection, geosrs:FoucautSinusoidalProjection, geosrs:FournierIIProjection, geosrs:GinzburgVIIIProjection, geosrs:GoodeHomolosineProjection, geosrs:HEALPixProjection, geosrs:HatanoAsymmetricalEqualAreaProjection, geosrs:HufnagelProjection, geosrs:Kavrayskiy7Projection, geosrs:LoximuthalProjection, geosrs:MayrProjection, geosrs:McBrydeThomasFlatPolarParabolicProjection, geosrs:McBrydeThomasFlatPolarQuarticProjection, geosrs:McBrydeThomasFlatPolarSinusoidalProjection, geosrs:McBrydeThomasIIProjection, geosrs:McBrydeThomasIProjection, geosrs:NaturalEarth2Projection, geosrs:NaturalEarthProjection, geosrs:NellHammerProjection, geosrs:NellProjection, geosrs:OrteliusOvalProjection, geosrs:PseudoCylindricalProjection, geosrs:PutninsP1Projection, geosrs:PutninsP2Projection, geosrs:PutninsP3Projection, geosrs:PutninsP5Projection, geosrs:PutninsP6Projection, geosrs:QuarticAuthalicProjection,

## REQUIREMENT 38: PSEUDO CYLINDRICAL PROJECTIONS

geosrs:RobinsonProjection, geosrs:SinusoidalProjection, geosrs:TheTimesProjection, geosrs:ToblerG1Projection, geosrs:ToblerHyperellipticalProjection, geosrs:WagnerIIIProjection, geosrs:WagnerIIProjection, geosrs:WagnerIProjection, geosrs:WagnerIVProjection, geosrs:WagnerVIProjection, geosrs:WagnerVProjection, geosrs:WerenskioldIProjection, geosrs:PutninsP3'Projection, geosrs:PutninsP4'Projection, geosrs:PutninsP5'Projection, geosrs:PutninsP6'Projection to be used in SPARQL graph patterns.

### 11.18.1. Class: geosrs:ApianIIProjection

**Table 273 – geosrs:ApianIIProjection**

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

### 11.18.2. Class: geosrs:AtlantisProjection

**Table 274 – geosrs:AtlantisProjection**

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

### 11.18.3. Class: geosrs:BaranyillIIProjection

**Table 275 – geosrs:BaranyillIIProjection**

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

### 11.18.4. Class: geosrs:BaranyillIIProjection

**Table 276 – geosrs:BaranyillIIProjection**

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

[PseudoCylindricalProjection](#)

### 11.18.5. Class: geosrs:BaranyilProjection

**Table 277** – geosrs:BaranyilProjection

URI

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

Super-classes

[PseudoCylindricalProjection](#)

### 11.18.6. Class: geosrs:BaranyilVProjection

**Table 278** – geosrs:BaranyilVProjection

URI

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

Super-classes

[PseudoCylindricalProjection](#)

### 11.18.7. Class: geosrs:BoggsEumorphicProjection

**Table 279** – geosrs:BoggsEumorphicProjection

URI

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

Super-classes

[PseudoCylindricalProjection](#)

### 11.18.8. Class: geosrs:BromleyProjection

**Table 280** – geosrs:BromleyProjection

URI

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

Super-classes

[PseudoCylindricalProjection](#)

## 11.18.9. Class: geosrs:CabotProjection

**Table 281** – geosrs:CabotProjection

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

## 11.18.10. Class: geosrs:CollignonProjection

**Table 282** – geosrs:CollignonProjection

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

## 11.18.11. Class: geosrs:CrasterParabolicProjection

**Table 283** – geosrs:CrasterParabolicProjection

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

## 11.18.12. Class: geosrs:DeakinMinimumErrorProjection

**Table 284** – geosrs:DeakinMinimumErrorProjection

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

### **11.18.13. Class: geosrs:Eckert1Projection**

**Table 285 – geosrs:Eckert1Projection**

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

### **11.18.14. Class: geosrs:Eckert2Projection**

**Table 286 – geosrs:Eckert2Projection**

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

### **11.18.15. Class: geosrs:Eckert3Projection**

**Table 287 – geosrs:Eckert3Projection**

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

### **11.18.16. Class: geosrs:Eckert4Projection**

**Table 288 – geosrs:Eckert4Projection**

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

### **11.18.17. Class: geosrs:Eckert5Projection**

**Table 289** – geosrs:Eckert5Projection

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

### 11.18.18. Class: geosrs:Eckert6Projection

**Table 290** – geosrs:Eckert6Projection

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

### 11.18.19. Class: geosrs:EqualEarthProjection

**Table 291** – geosrs:EqualEarthProjection

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

### 11.18.20. Class: geosrs:FaheyProjection

**Table 292** – geosrs:FaheyProjection

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

### 11.18.21. Class: geosrs:FoucautProjection

**Table 293** – geosrs:FoucautProjection

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

[PseudoCylindricalProjection](#)

## 11.18.22. Class: geosrs:FoucautSinusoidalProjection

**Table 294** – geosrs:FoucautSinusoidalProjection

URI

[https://w3id.org/geosrs/projection/  
FoucautSinusoidalProjection](https://w3id.org/geosrs/projection/FoucautSinusoidalProjection)

Super-classes

[PseudoCylindricalProjection](#)

## 11.18.23. Class: geosrs:FournierIIProjection

**Table 295** – geosrs:FournierIIProjection

URI

[https://w3id.org/geosrs/projection/  
FournierIIProjection](https://w3id.org/geosrs/projection/FournierIIProjection)

Super-classes

[PseudoCylindricalProjection](#)

## 11.18.24. Class: geosrs:GinzburgVIIIProjection

**Table 296** – geosrs:GinzburgVIIIProjection

URI

[https://w3id.org/geosrs/projection/  
GinzburgVIIIProjection](https://w3id.org/geosrs/projection/GinzburgVIIIProjection)

Super-classes

[PseudoCylindricalProjection](#)

## 11.18.25. Class: geosrs:GoodeHomolosineProjection

**Table 297** – geosrs:GoodeHomolosineProjection

URI

[https://w3id.org/geosrs/projection/  
GoodeHomolosineProjection](https://w3id.org/geosrs/projection/GoodeHomolosineProjection)

Super-classes

[PseudoCylindricalProjection](#)

## 11.18.26. Class: geosrs:HEALPixProjection

**Table 298** – geosrs:HEALPixProjection

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

## 11.18.27. Class: geosrs:HatanoAsymmetricalEqualAreaProjection

**Table 299** – geosrs:HatanoAsymmetricalEqualAreaProjection

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

## 11.18.28. Class: geosrs:HufnagelProjection

**Table 300** – geosrs:HufnagelProjection

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

## 11.18.29. Class: geosrs:Kavrayskiy7Projection

**Table 301** – geosrs:Kavrayskiy7Projection

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

## 11.18.30. Class: geosrs:LoximuthalProjection

**Table 302 – geosrs:LoximuthalProjection**

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

### 11.18.31. Class: geosrs:MayrProjection

**Table 303 – geosrs:MayrProjection**

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

### 11.18.32. Class: geosrs:McBrydeThomasFlatPolarParabolicProjection

**Table 304 – geosrs:McBrydeThomasFlatPolarParabolicProjection**

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

### 11.18.33. Class: geosrs:McBrydeThomasFlatPolarQuarticProjection

**Table 305 – geosrs:McBrydeThomasFlatPolarQuarticProjection**

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

### 11.18.34. Class: geosrs:McBrydeThomasFlatPolarSinusoidalProjection

**Table 306 – geosrs:McBrydeThomasFlatPolarSinusoidalProjection**

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

[PseudoCylindricalProjection](#)

### 11.18.35. Class: geosrs:McBrydeThomasIIProjection

**Table 307** – geosrs:McBrydeThomasIIProjection

URI

[https://w3id.org/geosrs/projection/  
McBrydeThomasIIProjection](https://w3id.org/geosrs/projection/McBrydeThomasIIProjection)

Super-classes

[PseudoCylindricalProjection](#)

### 11.18.36. Class: geosrs:McBrydeThomasIProjection

**Table 308** – geosrs:McBrydeThomasIProjection

URI

[https://w3id.org/geosrs/projection/  
McBrydeThomasIProjection](https://w3id.org/geosrs/projection/McBrydeThomasIProjection)

Super-classes

[PseudoCylindricalProjection](#)

### 11.18.37. Class: geosrs:NaturalEarth2Projection

**Table 309** – geosrs:NaturalEarth2Projection

URI

[https://w3id.org/geosrs/projection/  
NaturalEarth2Projection](https://w3id.org/geosrs/projection/NaturalEarth2Projection)

Super-classes

[PseudoCylindricalProjection](#)

### 11.18.38. Class: geosrs:NaturalEarthProjection

**Table 310** – geosrs:NaturalEarthProjection

URI

[https://w3id.org/geosrs/projection/  
NaturalEarthProjection](https://w3id.org/geosrs/projection/NaturalEarthProjection)

Definition

A pseudocylindrical map projection designed by Tom Patterson and introduced in 2008

Super-classes

[PseudoCylindricalProjection](#)

### **11.18.39. Class: geosrs:NellHammerProjection**

**Table 311** – geosrs:NellHammerProjection

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

### **11.18.40. Class: geosrs:NellProjection**

**Table 312** – geosrs:NellProjection

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

### **11.18.41. Class: geosrs:OrteliusOvalProjection**

**Table 313** – geosrs:OrteliusOvalProjection

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

### **11.18.42. Class: geosrs:PseudoCylindricalProjection**

**Table 314** – geosrs:PseudoCylindricalProjection

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

**Table 315 – geosrs:PutninsP1Projection**

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

#### 11.18.44. Class: geosrs:PutninsP2Projection

**Table 316 – geosrs:PutninsP2Projection**

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

#### 11.18.45. Class: geosrs:PutninsP3Projection

**Table 317 – geosrs:PutninsP3Projection**

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

#### 11.18.46. Class: geosrs:PutninsP5Projection

**Table 318 – geosrs:PutninsP5Projection**

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

#### 11.18.47. Class: geosrs:PutninsP6Projection

**Table 319 – geosrs:PutninsP6Projection**

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

## 11.18.48. Class: geosrs:QuarticAuthalicProjection

**Table 320** – geosrs:QuarticAuthalicProjection

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

## 11.18.49. Class: geosrs:RobinsonProjection

**Table 321** – geosrs:RobinsonProjection

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

## 11.18.50. Class: geosrs:SinusoidalProjection

**Table 322** – geosrs:SinusoidalProjection

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

## 11.18.51. Class: geosrs:TheTimesProjection

**Table 323** – geosrs:TheTimesProjection

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

## 11.18.52. Class: geosrs:ToblerG1Projection

**Table 324 – geosrs:ToblerG1Projection**

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

### 11.18.53. Class: geosrs:ToblerHyperellipticalProjection

**Table 325 – geosrs:ToblerHyperellipticalProjection**

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

### 11.18.54. Class: geosrs:WagnerIIIProjection

**Table 326 – geosrs:WagnerIIIProjection**

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

### 11.18.55. Class: geosrs:WagnerIIProjection

**Table 327 – geosrs:WagnerIIProjection**

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

### 11.18.56. Class: geosrs:WagnerIProjection

**Table 328 – geosrs:WagnerIProjection**

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

## 11.18.57. Class: geosrs:WagnerIVProjection

**Table 329** – geosrs:WagnerIVProjection

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

## 11.18.58. Class: geosrs:WagnerVIProjection

**Table 330** – geosrs:WagnerVIProjection

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

## 11.18.59. Class: geosrs:WagnerVProjection

**Table 331** – geosrs:WagnerVProjection

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

## 11.18.60. Class: geosrs:WerenskioldIProjection

**Table 332** – geosrs:WerenskioldIProjection

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

## 11.18.61. Class: geosrs:PutninsP3Projection

**Table 333 – geosrs:PutninsP3’Projection**

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

## 11.18.62. Class: geosrs:PutninsP4’Projection

**Table 334 – geosrs:PutninsP4’Projection**

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

## 11.18.63. Class: geosrs:PutninsP5’Projection

**Table 335 – geosrs:PutninsP5’Projection**

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

## 11.18.64. Class: geosrs:PutninsP6’Projection

**Table 336 – geosrs:PutninsP6’Projection**

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

## 11.19. Stereographic Projections

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## REQUIREMENT 39: STEREOGRAPHIC PROJECTIONS

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

### 11.19.1. Class: geosrs:GallStereographicProjection

**Table 337 – geosrs:GallStereographicProjection**

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

### 11.19.2. Class: geosrs:MillerOblatedStereographicProjection

**Table 338 – geosrs:MillerOblatedStereographicProjection**

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

### 11.19.3. Class: geosrs:RoussilheProjection

**Table 339 – geosrs:RoussilheProjection**

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

12

# PLANET MODULE

---

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



Figure 7

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

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

## 12.1. Interstellar Body

---

### REQUIREMENT 40: INTERSTELLAR BODY

**IDENTIFIER** /req/planet/Interstellar\_Body

**STATEMENT** Implementations shall allow the RDFS classes geosrs:ArtificialSatellite, geosrs:Asteroid, geosrs:Comet, geosrs:DwarfPlanet, geosrs:InterstellarBody, geosrs:Moon, geosrs:NaturalSatellite, geosrs:Planet, geosrs:PlanetStatus, geosrs:Plutoid, geosrs:Star, geosrs:Satellite to be used in SPARQL graph patterns.

### 12.1.1. Class: geosrs:ArtificialSatellite

**Table 340 – geosrs:ArtificialSatellite**

URI	<a href="https://w3id.org/geosrs/planet/ArtificialSatellite">https://w3id.org/geosrs/planet/ArtificialSatellite</a>
Super-classes	Satellite

### 12.1.2. Class: geosrs:Asteroid

**Table 341 – geosrs:Asteroid**

URI	<a href="https://w3id.org/geosrs/planet/Asteroid">https://w3id.org/geosrs/planet/Asteroid</a>
Definition	Asteroid, any of a host of small bodies, about 1000 km (600 miles) or less in diameter, that orbit the Sun primarily between the orbits of Mars and Jupiter in a nearly flat ring called the asteroid belt (source: <a href="https://www.britannica.com/science/asteroid">https://www.britannica.com/science/asteroid</a> )
Super-classes	<a href="#">InterstellarBody</a>

### 12.1.3. Class: geosrs:Comet

**Table 342 – geosrs:Comet**

URI	<a href="https://w3id.org/geosrs/planet/Comet">https://w3id.org/geosrs/planet/Comet</a>
Super-classes	<a href="#">InterstellarBody</a>

#### 12.1.4. Class: geosrs:DwarfPlanet

**Table 343 – geosrs:DwarfPlanet**

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

**Table 344 – geosrs:InterstellarBody**

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

**Table 345 – geosrs:Moon**

URI	<a href="https://w3id.org/geosrs/planet/Moon">https://w3id.org/geosrs/planet/Moon</a>
Super-classes	<a href="#">InterstellarBody</a>

#### 12.1.7. Class: geosrs:NaturalSatellite

**Table 346 – geosrs:NaturalSatellite**

URI	<a href="https://w3id.org/geosrs/planet/NaturalSatellite">https://w3id.org/geosrs/planet/NaturalSatellite</a>
Super-classes	<a href="#">Satellite</a>

## 12.1.8. Class: geosrs:Planet

**Table 347** – geosrs:Planet

URI	<a href="https://w3id.org/geosrs/planet/Planet">https://w3id.org/geosrs/planet/Planet</a>
Super-classes	<a href="#">InterstellarBody</a>

## 12.1.9. Class: geosrs:PlanetStatus

**Table 348** – geosrs:PlanetStatus

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

**Table 349** – geosrs:Plutoid

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

**Table 350** – geosrs:Star

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

## 12.1.12. Class: geosrs:Satellite

**Table 351** – geosrs:Satellite

URI	<a href="https://w3id.org/geosrs/planet/Satellite">https://w3id.org/geosrs/planet/Satellite</a>
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13

# COMMON INSTANCES

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

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

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

### 13.1. Coordinate System Axis

#### REQUIREMENT 41: COORDINATE SYSTEM AXIS

IDENTIFIER	/req/instances/Coordinate_System_Axis
STATEMENT	Implementations shall allow the RDFS instances geosrs:Down, geosrs:East, geosrs:North, geosrs:South, geosrs:Up, geosrs:West to be used in SPARQL graph patterns.

#### 13.1.1. Instance: geosrs:Down

Table 352 – geosrs:Down

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

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

**Table 353 – geosrs:East**

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

### 13.1.3. Instance: geosrs:North

**Table 354 – geosrs:North**

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

### 13.1.4. Instance: geosrs:South

**Table 355 – geosrs:South**

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

### 13.1.5. Instance: geosrs:Up

**Table 356 – geosrs:Up**

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

### 13.1.6. Instance: geosrs:West

**Table 357 – geosrs:West**

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

## 13.2. SRS Literal Types

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### REQUIREMENT 42: SRS LITERAL TYPES

**IDENTIFIER** /req/instances/SRS\_Literal\_Types

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

### 13.2.1. Instance: geosrs:proj4Literal

**Table 358 – geosrs:proj4Literal**

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

Example

[geosrs:proj4Literal](#)

### 13.2.2. Instance: geosrs:projJSONLiteral

Table 359 – geosrs:projJSONLiteral

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

### 13.2.3. Instance: geosrs:wktLiteral

Table 360 – geosrs:wktLiteral

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

## 13.3. Spheroids

---

### REQUIREMENT 43: SPHEROIDS

IDENTIFIER /req/instances/Spheroids

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

## REQUIREMENT 43: SPHEROIDS

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

### 13.3.1. Instance: geosrs:GRS1980

**Table 361** – geosrs:GRS1980

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

### 13.3.2. Instance: geosrs:GRS67

**Table 362** – geosrs:GRS67

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

### 13.3.3. Instance: geosrs:PZ90

**Table 363** – geosrs:PZ90

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

Example

[geosrs:PZ90](#)

### 13.3.4. Instance: geosrs:Airy1830

**Table 364** – geosrs:Airy1830

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

### 13.3.5. Instance: geosrs:AiryModified1849

**Table 365** – geosrs:AiryModified1849

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

### 13.3.6. Instance: geosrs:International1924

**Table 366** – geosrs:International1924

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

### 13.3.7. Instance: geosrs:AustralianNationalSpheroid

**Table 367** – geosrs:AustralianNationalSpheroid

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

### 13.3.8. Instance: geosrs:Everest1930

**Table 368** – geosrs:Everest1930

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

### 13.3.9. Instance: geosrs:Clarke1866

**Table 369** – geosrs:Clarke1866

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

### 13.3.10. Instance: geosrs:Plessis1817

**Table 370 – geosrs:Plessis1817**

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

### 13.3.11. Instance: geosrs:Danish1876

**Table 371 – geosrs:Danish1876**

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

### 13.3.12. Instance: geosrs:Struve1860

**Table 372 – geosrs:Struve1860**

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

### 13.3.13. Instance: geosrs:IAG1975

**Table 373 – geosrs:IAG1975**

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

### 13.3.14. Instance: geosrs:Clarke1858

**Table 374 – geosrs:Clarke1858**

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

### 13.3.15. Instance: geosrs:Clarke1880

**Table 375 – geosrs:Clarke1880**

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

### 13.3.16. Instance: geosrs:Helmert1906

**Table 376 – geosrs:Helmert1906**

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

Definition	Helmert 1906 Spheroid
Example	<a href="#">geosrs:Helmer1906</a>

### 13.3.17. Instance: geosrs:CGCS2000

**Table 377 – geosrs:CGCS2000**

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

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

**Table 378 – geosrs:GSK-2011**

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

### 13.3.19. Instance: geosrs:Zach1812

**Table 379 – geosrs:Zach1812**

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

### 13.3.20. Instance: geosrs:Clarke1880ARC

**Table 380** – geosrs:Clarke1880ARC

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

### 13.3.21. Instance: geosrs:Clarke1880IGN

**Table 381** – geosrs:Clarke1880IGN

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

### 13.3.22. Instance: geosrs:WGS66

**Table 382** – geosrs:WGS66

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

### 13.3.23. Instance: geosrs:WGS72

**Table 383 – geosrs:WGS72**

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

### 13.3.24. Instance: geosrs:WGS84

**Table 384 – geosrs:WGS84**

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

### 13.3.25. Instance: geosrs:Krassowsky1940

**Table 385 – geosrs:Krassowsky1940**

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



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A

# ANNEX A (NORMATIVE) ABSTRACT TEST SUITE

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**A**

# ANNEX A (NORMATIVE) ABSTRACT TEST SUITE

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## A.0. Overview

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

## A.1. Conformance Class: Core

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### CONFORMANCE CLASS A.1: 06-CORE.ADOC

IDENTIFIER /conf/core

REQUIREMENTS CLASS Requirements class 1: /req/core

CONFORMANCE TESTS Abstract test A.1: /conf/core/Coordinate\_Reference\_System\_Parameters  
Abstract test A.2: /conf/core/Coordinate\_Reference\_System\_Types  
Abstract test A.3: /conf/core/Coordinate\_Reference\_System\_Properties

### A.1.1. Coordinate Reference System Parameters

#### ABSTRACT TEST A.1

IDENTIFIER /conf/core/Coordinate\_Reference\_System\_Parameters

## ABSTRACT TEST A.1

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

## A.1.2. Coordinate Reference System Types

## ABSTRACT TEST A.2

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

## A.1.3. Coordinate Reference System Properties

## ABSTRACT TEST A.3

IDENTIFIER	/conf/core/Coordinate_Reference_System_Properties
REQUIREMENT	Requirement 2: /req/core/Coordinate_Reference_System_Properties
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:method return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:method

## A.2. Conformance Class: Co

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

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

## A.2.1. Coordinate Operation Methods

### ABSTRACT TEST A.4

IDENTIFIER	/conf/co/Coordinate_Operation_Methods
REQUIREMENT	Requirement 5: /req/co/Coordinate_Operation_Methods
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:CoordinateOperation geosrs:PassThroughOperation geosrs:ConcatenatedOperation geosrs:SingleOperation geosrs:Transformation geosrs:Conversion

## ABSTRACT TEST A.4

geosrs:PointMotionOperation geosrs:OperationMethod return the correct result on a test dataset.
<b>TEST-METHOD-TYPE</b> Capabilities
<b>REFERENCE</b> geosrs:CoordinateOperation geosrs:PassThroughOperation geosrs:ConcatenatedOperation geosrs:SingleOperation geosrs:Transformation geosrs:Conversion geosrs:PointMotionOperation geosrs:OperationMethod

## A.2.2. Coordinate Operation Parameters

### ABSTRACT TEST A.5

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

## A.2.3. Coordinate Operation Categories

### ABSTRACT TEST A.6

<b>IDENTIFIER</b>	/conf/co/Coordinate_Operation_Categories
<b>REQUIREMENT</b>	Requirement 4: /req/co/Coordinate_Operation_Categories
<b>TEST PURPOSE</b>	Check conformance with this requirement
<b>TEST METHOD</b>	Verify that queries involving geosrs:GeographicObject geosrs:RegisterOperations geosrs:Scale Operation geosrs:RotationOperation geosrs:IdentityOperation geosrs:ShearOperation geosrs:

## ABSTRACT TEST A.6

TranslationOperation geosrs:AffineTransformationOperation geosrs:CoordinateTransformation  
Operation return the correct result on a test dataset.

TEST-METHOD-  
TYPE

Capabilities

REFERENCE

geosrs:GeographicObject geosrs:RegisterOperations geosrs:ScaleOperation geosrs:Rotation  
Operation geosrs:IdentityOperation geosrs:ShearOperation geosrs:TranslationOperation geosrs:  
AffineTransformationOperation geosrs:CoordinateTransformationOperation

## A.2.4. Coordinate Operation Properties

### ABSTRACT TEST A.7

IDENTIFIER /conf/co/Coordinate\_Operation\_Properties

REQUIREMENT Requirement 7: /req/co/Coordinate\_Operation\_Properties

TEST PURPOSE Check conformance with this requirement

TEST METHOD Verify that queries involving geosrs:derivingConversion geosrs:parameter geosrs:sourceCRS  
geosrs:targetCRS return the correct result on a test dataset.

TEST-METHOD-  
TYPE

Capabilities

REFERENCE geosrs:derivingConversion geosrs:parameter geosrs:sourceCRS geosrs:targetCRS

## A.3. Conformance Class: Cs

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

IDENTIFIER /conf/cs

REQUIREMENTS CLASS Requirements class 3: /req/cs

CONFORMANCE TESTS

Abstract test A.8: /conf/cs/Temporal\_Coordinate\_Systems

Abstract test A.9: /conf/cs/3D\_Coordinate\_Systems

Abstract test A.10: /conf/cs/Coordinate\_System\_Types

Abstract test A.11: /conf/cs/Celestial\_Coordinate\_Systems

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

Abstract test A.12: /conf/cs/Coordinate\_System\_Components

Abstract test A.13: /conf/cs/Coordinate\_System\_Properties

### A.3.1. Temporal Coordinate Systems

#### ABSTRACT TEST A.8

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

### A.3.2. 3D Coordinate Systems

#### ABSTRACT TEST A.9

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

### A.3.3. Coordinate System Types

#### ABSTRACT TEST A.10

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

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

**TEST PURPOSE** Check conformance with this requirement

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

**TEST-METHOD-TYPE** Capabilities

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

### A.3.4. Celestial Coordinate Systems

#### ABSTRACT TEST A.11

**IDENTIFIER** /conf/cs/Celestial\_Coordinate\_Systems

**REQUIREMENT** Requirement 9: /req/cs/Celestial\_Coordinate\_Systems

**TEST PURPOSE** Check conformance with this requirement

**TEST METHOD** Verify that queries involving geosrs:CelestialCoordinateSystem geosrs:EclipticCoordinateSystem geosrs:EquatorialCoordinateSystem geosrs:GalacticCoordinateSystem geosrs:Horizontal

## ABSTRACT TEST A.11

CoordinateSystem geosrs:PerifocalCoordinateSystem geosrs:SuperGalacticCS	return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:CelestialCoordinateSystem geosrs:EclipticCoordinateSystem geosrs:EquatorialCoordinateSystem geosrs:GalacticCoordinateSystem geosrs:HorizontalCoordinateSystem geosrs:PerifocalCoordinateSystem geosrs:SuperGalacticCS

## A.3.5. Coordinate System Components

### ABSTRACT TEST A.12

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

## A.3.6. Coordinate System Properties

### ABSTRACT TEST A.13

IDENTIFIER	/conf/cs/Coordinate_System_Properties
REQUIREMENT	Requirement 11: /req/cs/Coordinate_System_Properties
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:axis geosrs:axisDirection return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities

## ABSTRACT TEST A.13

REFERENCE geosrs:axis geosrs:axisDirection

## A.4. Conformance Class: Datum

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

IDENTIFIER /conf/datum

REQUIREMENTS CLASS Requirements class 4: /req/datum

CONFORMANCE TESTS Abstract test A.14: /conf/datum/Datum\_Types  
Abstract test A.15: /conf/datum/Datum\_Parameters  
Abstract test A.16: /conf/datum/Spheroid\_Types  
Abstract test A.17: /conf/datum/Spheroid\_Properties  
Abstract test A.18: /conf/datum/Datum\_Properties

### A.4.1. Datum Types

## ABSTRACT TEST A.14

IDENTIFIER /conf/datum/Datum\_Types

REQUIREMENT Requirement 16: /req/datum/Datum\_Types

TEST PURPOSE Check conformance with this requirement

TEST METHOD Verify that queries involving geosrs:Datum geosrs:GeodeticDatum geosrs:DynamicGeodeticReferenceFrame geosrs:VerticalDatum geosrs:DynamicVerticalDatum geosrs:ParametricDatum geosrs:EngineeringDatum geosrs:TemporalDatum geosrs:DatumEnsemble return the correct result on a test dataset.

TEST-METHOD-TYPE Capabilities

REFERENCE geosrs:Datum geosrs:GeodeticDatum geosrs:DynamicGeodeticReferenceFrame geosrs:VerticalDatum geosrs:DynamicVerticalDatum geosrs:ParametricDatum geosrs:EngineeringDatum geosrs:TemporalDatum geosrs:DatumEnsemble

## A.4.2. Datum Parameters

### ABSTRACT TEST A.15

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

## A.4.3. Spheroid Types

### ABSTRACT TEST A.16

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

## A.4.4. Spheroid Properties

## ABSTRACT TEST A.17

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

## A.4.5. Datum Properties

## ABSTRACT TEST A.18

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

## A.5. Conformance Class: Srsapplication

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

IDENTIFIER	/conf/srsapplication
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## CONFORMANCE CLASS A.5: 10-SRSAPPLICATION\_MODULE.ADOC

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

### A.5.1. SRS Application Types

#### ABSTRACT TEST A.19

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

### A.5.2. Map Types

#### ABSTRACT TEST A.20

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

## ABSTRACT TEST A.20

### REFERENCE

geosrs:CadastreMap geosrs:NauticalChart geosrs:ThematicMap geosrs:TopographicMap geosrs:WeatherMap

## A.6. Conformance Class: Projections

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

IDENTIFIER /conf/projections

REQUIREMENTS CLASS Requirements class 6: /req/projections

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

### A.6.1. Lenticular Projections

## ABSTRACT TEST A.21

IDENTIFIER /conf/projections/Lenticular\_Projections

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

## ABSTRACT TEST A.21

**TEST PURPOSE** Check conformance with this requirement

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

**TEST-METHOD-TYPE** Capabilities

**REFERENCE** geosrs:A4Projection geosrs:BriesemeisterProjection geosrs:CircIProjection geosrs:CupolaProjection geosrs:DedistortProjection geosrs:DietrichKitadaProjection geosrs:FranculaIIIProjection geosrs:FranculaIVProjection geosrs:FranculaIXProjection geosrs:FranculaVIIIProjection geosrs:FranculaVProjection geosrs:FranculaXIIProjection geosrs:FranculaXIVProjection geosrs:HamusoidalProjection geosrs:KissProjection

## A.6.2. Conformal Projections

### ABSTRACT TEST A.22

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

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

**TEST PURPOSE** Check conformance with this requirement

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

**TEST-METHOD-TYPE** Capabilities

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

## A.6.3. Minimum Error Projections

## ABSTRACT TEST A.23

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

## A.6.4. Pseudo Azimuthal Projections

## ABSTRACT TEST A.24

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

## A.6.5. Equal Area Projections

## ABSTRACT TEST A.25

IDENTIFIER	/conf/projections/Equal_Area_Projections
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## ABSTRACT TEST A.25

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

**TEST PURPOSE** Check conformance with this requirement

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

**TEST-METHOD-TYPE** Capabilities

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

## A.6.6. Pseudo Conical Projections

### ABSTRACT TEST A.26

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

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

**TEST PURPOSE** Check conformance with this requirement

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

**TEST-METHOD-TYPE** Capabilities

**REFERENCE** geosrs:AmericanPolyconicProjection geosrs:BonneProjection geosrs:BottomleyProjection geosrs:NicolosiGlobularProjection geosrs:PseudoConicalProjection geosrs:PtolemyIIProjection geosrs:StabiusWernerIIProjection geosrs:WernerProjection

## A.6.7. Globular Projections

ABSTRACT TEST A.27	
IDENTIFIER	/conf/projections/Globular_Projections
REQUIREMENT	Requirement 29: /req/projections/Globular_Projections
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:ApianGlobularProjection geosrs:BaconGlobularProjection geosrs:FournierGlobularProjection return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:ApianGlobularProjection geosrs:BaconGlobularProjection geosrs:FournierGlobularProjection

## A.6.8. Pseudo Cylindrical Projections

ABSTRACT TEST A.28	
IDENTIFIER	/conf/projections/Pseudo_Cylindrical_Projections
REQUIREMENT	Requirement 38: /req/projections/Pseudo_Cylindrical_Projections
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:ApianIIProjection geosrs:AtlantisProjection geosrs:BaranyillIIProjection geosrs:BaranyillProjection geosrs:BaranyilProjection geosrs:BaranyiIVProjection geosrs:BoggsEumorphicProjection geosrs:BromleyProjection geosrs:CabotProjection geosrs:CollignonProjection geosrs:CrasterParabolicProjection geosrs:DeakinMinimumErrorProjection geosrs:Eckert1Projection geosrs:Eckert2Projection geosrs:Eckert3Projection geosrs:Eckert4Projection geosrs:Eckert5Projection geosrs:Eckert6Projection geosrs:EqualEarthProjection geosrs:FaheyProjection geosrs:FoucautProjection geosrs:FoucautSinusoidalProjection geosrs:FournierIIProjection geosrs:GinzburgVIIIProjection geosrs:GoodeHomolosineProjection geosrs:HEALPixProjection geosrs:HatanoAsymmetricalEqualAreaProjection geosrs:HufnagelProjection geosrs:Kavrayskiy7Projection geosrs:LoximuthalProjection geosrs:MayrProjection geosrs:McBrydeThomasFlatPolarParabolicProjection geosrs:McBrydeThomasFlatPolarQuarticProjection geosrs:McBrydeThomasFlatPolarSinusoidalProjection geosrs:McBrydeThomasIIProjection geosrs:McBrydeThomasIProjection geosrs:NaturalEarth2Projection geosrs:NaturalEarthProjection geosrs:NellHammerProjection geosrs:NellProjection geosrs:OrteliusOvalProjection geosrs:

## ABSTRACT TEST A.28

PseudoCylindricalProjection geosrs:PutninsP1Projection geosrs:PutninsP2Projection geosrs:PutninsP3Projection geosrs:PutninsP5Projection geosrs:PutninsP6Projection geosrs:QuarticAuthalicProjection geosrs:RobinsonProjection geosrs:SinusoidalProjection geosrs:TheTimesProjection geosrs:ToblerG1Projection geosrs:ToblerHyperellipticalProjection geosrs:WagnerIIIProjection geosrs:WagnerIIProjection geosrs:WagnerIProjection geosrs:WagnerIVProjection geosrs:WagnerVIProjection geosrs:WagnerVProjection geosrs:WerenskioldIProjection geosrs:PutninsP3'Projection geosrs:PutninsP4'Projection geosrs:PutninsP5'Projection geosrs:PutninsP6'Projection return the correct result on a test dataset.

TEST-

METHOD-

Capabilities

TYPE

REFERENCE

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

## A.6.9. Archaic Projections

### ABSTRACT TEST A.29

IDENTIFIER /conf/projections/Archaic\_Projections

REQUIREMENT Requirement 21: /req/projections/Archaic\_Projections

TEST PURPOSE Check conformance with this requirement

## ABSTRACT TEST A.29

TEST METHOD	Verify that queries involving geosrs:ArchaicProjection geosrs:PtolemyIProjection return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:ArchaicProjection geosrs:PtolemyIProjection

## A.6.10. Cylindrical Projections

### ABSTRACT TEST A.30

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

## A.6.11. Compromise Projections

## ABSTRACT TEST A.31

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

## A.6.12. Polyhedral Projections

## ABSTRACT TEST A.32

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

## ABSTRACT TEST A.32

Projection geosrs:IcosahedralProjection geosrs:LeeProjection geosrs:MyrahedalProjection geosrs:  
OctantProjection geosrs:PolyhedralProjection geosrs:QuadrilateralizedSphericalCubeProjection  
geosrs:WatermanButterflyProjection

### A.6.13. Equidistant Projections

#### ABSTRACT TEST A.33

**IDENTIFIER** /conf/projections/Equidistant\_Projections

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

**TEST PURPOSE** Check conformance with this requirement

**TEST METHOD** Verify that queries involving geosrs:AzimuthalEquidistantProjection geosrs:BerghausStar  
Projection geosrs:CassiniProjection geosrs:EquidistantConicProjection geosrs:Equidistant  
CylindricalProjection geosrs:EquidistantProjection geosrs:EquirectangularProjection geosrs:  
ObliquePlateCarreeProjection geosrs:PlateCarreeProjection geosrs:TwoPointEquidistant  
Projection return the correct result on a test dataset.

**TEST-METHOD-  
TYPE** Capabilities

**REFERENCE** geosrs:AzimuthalEquidistantProjection geosrs:BerghausStarProjection geosrs:CassiniProjection  
geosrs:EquidistantConicProjection geosrs:EquidistantCylindricalProjection geosrs:Equidistant  
Projection geosrs:EquirectangularProjection geosrs:ObliquePlateCarreeProjection geosrs:Plate  
CarreeProjection geosrs:TwoPointEquidistantProjection

### A.6.14. Azimuthal Projections

#### ABSTRACT TEST A.34

**IDENTIFIER** /conf/projections/Azimuthal\_Projections

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

**TEST PURPOSE** Check conformance with this requirement

**TEST METHOD** Verify that queries involving geosrs:AzimuthalProjection geosrs:BreusingGeometricProjection  
geosrs:BreusingHarmonicProjection geosrs:GinzburgIIProjection geosrs:GinzburgIProjection  
geosrs:GnomonicProjection geosrs:JamesAzimuthalProjection return the correct result on a test  
dataset.

## ABSTRACT TEST A.34

TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:AzimuthalProjection geosrs:BreusingGeometricProjection geosrs:BreusingHarmonicProjection geosrs:GinzburgIIProjection geosrs:GinzburgIProjection geosrs:GnomonicProjection geosrs:JamesAzimuthalProjection

## A.6.15. Conical Projections

### ABSTRACT TEST A.35

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

## A.6.16. Perspective Projections

### ABSTRACT TEST A.36

IDENTIFIER	/conf/projections/Perspective_Projections
REQUIREMENT	Requirement 32: /req/projections/Perspective_Projections
TEST PURPOSE	Check conformance with this requirement

## ABSTRACT TEST A.36

TEST METHOD	Verify that queries involving geosrs:CentralCylindricalProjection geosrs:GeneralVerticalPerspectiveProjection geosrs:GilbertTwoWorldPerspectiveProjection geosrs:LaHireProjection geosrs:LorgnaProjection geosrs:LowryProjection geosrs:OrthographicProjection geosrs:PerspectiveConicProjection geosrs:PerspectiveProjection geosrs:TiltedPerspectiveProjection geosrs:VerticalPerspectiveProjection return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:CentralCylindricalProjection geosrs:GeneralVerticalPerspectiveProjection geosrs:GilbertTwoWorldPerspectiveProjection geosrs:LaHireProjection geosrs:LorgnaProjection geosrs:LowryProjection geosrs:OrthographicProjection geosrs:PerspectiveConicProjection geosrs:PerspectiveProjection geosrs:TiltedPerspectiveProjection geosrs:VerticalPerspectiveProjection

## A.6.17. Stereographic Projections

### ABSTRACT TEST A.37

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

## A.6.18. Polyconic Projections

### ABSTRACT TEST A.38

IDENTIFIER	/conf/projections/Polyconic_Projections
REQUIREMENT	Requirement 33: /req/projections/Polyconic_Projections
TEST PURPOSE	Check conformance with this requirement

## ABSTRACT TEST A.38

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

## A.6.19. Projection

## ABSTRACT TEST A.39

IDENTIFIER	/conf/projections/Projection
REQUIREMENT	Requirement 35: /req/projections/Projection
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:Projection return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:Projection

## A.7. Conformance Class: Planet

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

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

### A.7.1. Interstellar Body

#### ABSTRACT TEST A.40

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

## A.8. Conformance Class: Instances

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

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

## A.8.1. Coordinate System Axis

### ABSTRACT TEST A.41

IDENTIFIER	/conf/instances/Coordinate_System_Axis
REQUIREMENT	Requirement 41: /req/instances/Coordinate_System_Axis
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:Down geosrs:East geosrs:North geosrs:South geosrs:Up geosrs:West return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:Down geosrs:East geosrs:North geosrs:South geosrs:Up geosrs:West

## A.8.2. Spheroids

### ABSTRACT TEST A.42

IDENTIFIER	/conf/instances/Spheroids
REQUIREMENT	Requirement 43: /req/instances/Spheroids
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:GRS1980 geosrs:GRS67 geosrs:PZ90 geosrs:Airy1830 geosrs:AiryModified1849 geosrs:International1924 geosrs:AustralianNationalSpheroid geosrs:Everest1930 geosrs:Clarke1866 geosrs:Plessis1817 geosrs:Danish1876 geosrs:Struve1860 geosrs:IAG1975 geosrs:Clarke1858 geosrs:Clarke1880 geosrs:Helmert1906 geosrs:CGCS2000 geosrs:GSK-2011 geosrs:Zach1812 geosrs:Clarke1880ARC geosrs:Clarke1880IGN geosrs:WGS66 geosrs:WGS72 geosrs:WGS84 geosrs:Krassowsky1940 return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:GRS1980 geosrs:GRS67 geosrs:PZ90 geosrs:Airy1830 geosrs:AiryModified1849 geosrs:International1924 geosrs:AustralianNationalSpheroid geosrs:Everest1930 geosrs:Clarke1866 geosrs:Plessis1817 geosrs:Danish1876 geosrs:Struve1860 geosrs:IAG1975 geosrs:Clarke1858 geosrs:Clarke1880 geosrs:Helmert1906 geosrs:CGCS2000 geosrs:GSK-2011 geosrs:Zach1812

## ABSTRACT TEST A.42

geosrs:Clarke1880ARC geosrs:Clarke1880IGN geosrs:WGS66 geosrs:WGS72 geosrs:WGS84  
geosrs:Krassowsky1940

### A.8.3. SRS Literal Types

## ABSTRACT TEST A.43

IDENTIFIER	/conf/instances/SRS_Literal_Types
REQUIREMENT	Requirement 42: /req/instances/SRS_Literal_Types
TEST PURPOSE	Check conformance with this requirement
TEST METHOD	Verify that queries involving geosrs:proj4Literal geosrs:projJSONLiteral geosrs:wktLiteral return the correct result on a test dataset.
TEST-METHOD-TYPE	Capabilities
REFERENCE	geosrs:proj4Literal geosrs:projJSONLiteral geosrs:wktLiteral



B

## ANNEX B (INFORMATIVE) ALIGNMENTS

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**B**

## ANNEX B (INFORMATIVE) ALIGNMENTS

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### Overview

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

**Table B.1 – Alignment: Namespaces**

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

### B.1. IGN Ontology

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

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

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

## B.2. ISO19111 Ontology

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

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

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

## B.3. IFC Ontology

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

FROM ELEMENT	MAPPING RELATION	TO ELEMENT	NOTES
<a href="#">geosrs:AxisDirection</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifcIfcDirection</a>	-
<a href="#">geosrs:CRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifcIfcCoordinateReferenceSystem</a>	-
<a href="#">geosrs:CoordinateOperation</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifcIfcCoordinateOperation</a>	-
<a href="#">geosrs:ProjectedCRS</a>	<a href="#">owl:equivalentClass</a>	<a href="#">ifcIfcProjectedCRS</a>	-
<a href="#">geosrs:axis</a>	<a href="#">owl:equivalentProperty</a>	<a href="#">ifcaxis_ifcAxis1Placement</a>	-
<a href="#">geosrs:sourceCRS</a>	<a href="#">owl:equivalentProperty</a>	<a href="#">ifcsourceCRS</a>	-
<a href="#">geosrs:targetCRS</a>	<a href="#">owl:equivalentProperty</a>	<a href="#">ifctargetCRS</a>	-

C

## ANNEX C (INFORMATIVE) SHACL SHAPES

---

**C**

## ANNEX C (INFORMATIVE) SHACL SHAPES

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

### Overview

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

#### C.1. SHACL Shapes: Core

**Table C.1 – Core**

LABEL	TARGETNODE	PROPERTY	CLASS	MINCOUNT	MAXCOUNT	COMMENT
Shape S1	geosrs:CRS	geosrs:coordinateSystem	geosrs:CoordinateSystem	1	1	A coordinate reference system should have exactly one coordinate system
Shape S2	geosrs:CRS	geosrs:domainOfValidity	geosrs:AreaOfUse	1	-	A coordinate reference system should have at least one area of use
Shape S3	geosrs:CRS	geosrs:datum	geosrs:Datum	-	1	A coordinate reference

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

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

## C.2. SHACL Shapes: Datum

Table C.2 – Datum

LABEL	TARGETNODE	PROPERTY	CLASS	MINCOUNT	MAXCOUNT	COMMENT
Shape S1	geosrs:Parametric Datum	geosrs:defining Parameter	geosrs:Defining Parameter	1	-	A parametric datum should have at least one defining parameter

## C.3. SHACL Shapes: Cs

Table C.3 – Cs

LABEL	TARGETNODE	PROPERTY	CLASS	MINCOUNT	MAXCOUNT	COM
Shape S1	geosrs:1DCoordinateSystem	geosrs:axis	geosrs:Coordinate SystemAxis	1	1	A 1D coordinate system should have exactly one axis
Shape S2	geosrs:3DCoordinateSystem	geosrs:axis	geosrs:Coordinate SystemAxis	3	-	A 3D coordinate system should have at least three axes
Shape S3	geosrs:ConicalCoordinateSystem	geosrs:axis	geosrs:Coordinate SystemAxis	3	-	A conical coordinate system

LABEL	TARGETNODE	PROPERTY	CLASS	MINCOUNT	MAXCOUNT	COM
Shape S4	geosrs:CoordinateSystem	geosrs:axis	geosrs:CoordinateSystemAxis	1	-	should have at least three axes
Shape S5	geosrs:CoordinateSystemAxis	geosrs:axisDirection	geosrs:AxisDirection	1	1	A coordinate system should have at least one axis
Shape S6	geosrs:CurvilinearCoordinateSystem	geosrs:axis	geosrs:CoordinateSystemAxis	3	-	A curvilinear coordinate system is defined in Euclidean space and should therefore have at least three axes
Shape S7	geosrs:CylindricalCoordinateSystem	geosrs:axis	geosrs:CoordinateSystemAxis	3	-	A cylindrical coordinate

LABEL	TARGETNODE	PROPERTY	CLASS	MINCOUNT	MAXCOUNT	COM
						system should have at least three axes
Shape S8	geosrs:DateTimeTemporalCoordinateSystem	geosrs:axis	geosrs:CoordinateSystemAxis	1	1	A date time temporal coordinate system should have exactly one axis
Shape S9	geosrs:PlanarCoordinateSystem	geosrs:axis	geosrs:CoordinateSystemAxis	2	-	A planar coordinate system should have at least two axes
Shape S10	geosrs:TemporalCoordinateSystem	geosrs:axis	geosrs:CoordinateSystemAxis	1	1	A temporal coordinate system should have exactly one axis
Shape S11	geosrs:TemporalCountCoordinateSystem	geosrs:axis	geosrs:CoordinateSystemAxis	1	1	A temporal count coordinate system should have exactly

LABEL	TARGETNODE	PROPERTY	CLASS	MINCOUNT	MAXCOUNT	COM
						one axis
Shape	geosrs:TemporalMeasureCoordinate	geosrs:axis	geosrs:Coordinate	1	1	A temporal measure coordinate system should have exactly one axis
S12	System		SystemAxis			



D

# ANNEX D (INFORMATIVE) APPLICATION EXAMPLES

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**D**

## ANNEX D (INFORMATIVE) APPLICATION EXAMPLES

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### Overview

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#### D.1. Minimum Example

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#### D.2. Elaborate Example

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E

## ANNEX E (INFORMATIVE) JSON-LD CONTEXT

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## ANNEX E (INFORMATIVE) JSON-LD CONTEXT

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

### Overview

#### E.1. Compatibility to PROJJSON

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

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

**Listing E.1**

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

#### E.2. Compatibility to OGCJSON

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



F

# ANNEX F (INFORMATIVE) REVISION HISTORY

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**F**

## ANNEX F (INFORMATIVE) REVISION HISTORY

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



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