3 Terms, definitions, symbols, and abbreviated terms

3.1 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at https://www.iso.org/obp
- IEC Electropedia: available at https://www.electropedia.org

3.1.1
Earth gravitational model
spherical harmonic expansion of the gravitational field potential

Note 1 to entry: Gravity includes rotational effects; however, such rotational effects are not included in this model.

3.1.2
ecliptic plane
plane defined by the orbit of a planet at a point in time

3.1.3
equatorial plane
plane through a designated centre of an object and perpendicular to the rotational axis of the object

3.1.4
geodetic datum
datum (or reference frame) describing the relationship of a 2- or 3-dimensional coordinate system to the Earth

Note 1 to entry: ISO 19111:2019 uses the term *geodetic reference frame*.

Note 2 to entry: In most cases, the geodetic datum includes an ellipsoid definition.

[SOURCE: ISO 19111:2019, 3.1.34]

3.1.5
north pole
that pole of rotation that lies on the north side of the invariable plane of the solar system

Note 1 to entry: Some planets have retrograde rotation with respect to this definition.

Note 2 to entry: Map north (see 5.3.7.1) may be unrelated to this direction.

Note 3 to entry: The north side of the invariable plane of the solar system is the side facing in the direction of Polaris.

[SOURCE: RIIC15]

3.1.6
replete set
connected subset of a Euclidean space with non-empty interior such that all its points belong to either its interior or to the topological closure of its interior

Note 1 to entry: A replete set is a generalization of an open set that allows the inclusion of boundary points. Boundary points are important in the definitions of certain coordinate systems.

3.1.7
spatial object
physical or virtual object to which spatial information applies

3.1.8
spatial operation
mathematical function that re-expresses coordinates, directions, and/or orientations expressed in one spatial reference frame in terms of a different spatial reference frame; or mathematical function for distance or other geometric quantities within a single spatial reference frame

3.2 Notation, symbols, and abbreviated terms

In this document, dates that are included in an element of a concept instance specification shall conform to the notation and formats of ISO 8601.

Table 3.1 lists mathematical notation conventions commonly used in this document.

Table 3.1 — Mathematical notation

Style	Use	Examples
lower case, bold, italic	points, vectors	$\boldsymbol{x}, \boldsymbol{p}$
lower case, italic	variables, scalars, scalar-valued functions, axes of a linear coordinate system	a, b, f, x-axis
upper case, bold, italic	vector-valued functions, matrices, orthogonal frames	$\boldsymbol{F}, \boldsymbol{G}, \boldsymbol{M}$
upper case, italic	sets	S, T

Upper case italic letter symbols are also used for scalar-valued functions that are customarily capitalized.

Table 3.2 lists the symbols used in this document.

Table 3.2 — Symbols

Symbol	Definition
CS_S	spatial coordinate system of SRF_S
ORM_S	object reference model of SRF_S
ORM_R	reference ORM for a given spatial object
SRF_S	source spatial reference frame
SRF_T	target spatial reference frame
$\mathbf{0}$	origin of an orthonormal frame
a	major semi-axis length of an oblate ellipsoid
b	minor semi-axis length of an oblate ellipsoid
$\boldsymbol{C}_i[\boldsymbol{G}]( )$	i^{th} coordinate-component curve at a point
$\boldsymbol{c}_S$	coordinate of a position in SRF_S
$d_E( )$	Euclidean distance function
$d_G( )$	geodesic distance function