

Ellipsoid (glossary)

ellipsoid

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Either (1) a geometric reference surface embedded in 3D Euclidean space represented by an ellipsoid of revolution where the rotation is about the polar axis, or (2) a reference ellipsoid, which is a geometric reference surface embedded in 3D Euclidean space formed by an ellipse that is rotated about a main axis.

Notes to Entry:

- For definition (1):
 1. For the Earth, the rotation is about the polar axis. This results in an oblate ellipsoid with midpoint of the foci located at the nominal center of the Earth.
 2. The two usual algorithms for latitude on an ellipsoid and on a sphere (such as used in spherical coordinates) are only equivalent if the ellipsoid is a sphere, having all radii equal in all directions. The problem is that a radial line from the center of a general ellipsoid does not always cross the surface of the ellipsoid orthogonally. In general, planar slices through the center do not intersect the surface orthogonally, and therefore the curves that correspond to the great circles of a sphere are not geodesics on the ellipsoid.
 3. The topology of the ellipsoid is inherited from the \mathbb{R}^3 space in which it is embedded. The difference is that metrics such as distance and direction on the ellipsoid are restricted to curves wholly on the surface and vectors tangent to the surface.
- For definition (2):
 1. For the Earth, the ellipsoid is bi-axial with rotation about the polar axis. This results in an oblate ellipsoid

with the midpoint of the foci located at the nominal center of the Earth.

Sources

ISO TC211. Ellipsoid. In: ISO TC211 Multilingual Glossary. Version from 2020-06-02. Concept ID: 2382. Available at: <https://isotc211.geolexica.org/concepts/2382/>.

Discussion

None.

SEBoK v. 2.7, released 31 October 2022

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This page was last edited on 9 October 2022, at 20:11.