

China Terrestrial Reference Frame 2000

Responsible Organization: National Bureau of Surveying and Geo-information

Abbreviated Frame Name: CTRF 2000

Associated TRS: ITRS

Coverage of Frame: Global

Type of Frame: 3-Dimensional

Last Version: CTRF 2000 (2000.0)

Reference Epoch: 2000.0

Brief Description: China Geodetic Coordinate System 2000 (CGCS 2000) is an Earth-centered, Earth-fixed terrestrial reference system and geodetic datum. CGCS 2000 is based on a consistent set of constants and model parameters that describe the Earth's size, shape, gravity and geomagnetic fields. CGCS 2000 is the standard Chinese geodetic reference system for geospatial information and BeiDou/COMPASS. It is compatible with the International Terrestrial Reference System (ITRS). The reference frame of CGCS 2000 is CTRF 2000, which is maintained by 28 CORS stations and more than 2500 GPS stations.

Definition of Frame

- **Origin:** Zero translation and translation rate with respect to ITRF1997
- **Scale:** Zero scale and scale rate with respect to ITRF1997
- **Orientation:** Zero rotation and rotation rate with respect to ITRF1997.
- **Time Evolution:** Zero rotation rate with respect to ITRF1997.

Coordinate System: Cartesian Coordinates (X, Y, Z)

Defining Parameters: CGCS 2000 identifies four defining parameters.

Parameter	Notation	Value
Semi-major Axis	a	6378137.0 meters
Flattening Factor of the Earth	1/f	298.257222101
Nominal Mean Angular Velocity of the Earth	ω	7292115×10^{-11} radians/second
Geocentric Gravitational Constant (Mass of Earth's Atmosphere Included)	GM	$3.986004418 \times 10^{14}$ meter ³ /second ²

References:

Chen J 1999. Consideration of improving and updating Chinese geodetic coordinate system. In: Collection of Geodesy, Beijing: Press of Surveying and Mapping (in Chinese)

Wei Z 2003. National geodetic coordinate system: to next generation. Geomatics and Information Science of Wuhan University, 28(2): 138-143 (in Chinese)

Yang Y 2009. Chinese geodetic coordinate system 2000, Chinese Science Bulletin, 54: 2714-2721.

Relationship with other reference systems:**Future Plans:**

China Bureau of National Surveying and Geo-information plans to conduct a new GPS network adjustment for updating CTRF 2000 in the second half of 2012 based on the ITRF 2008. Note that CGCS 2000 will retain its four defining parameters of which some do not comply with TN 36. When completed, the updated frame of CGCS 2000 will be open to use in China.