

Geodetic Datum Transformation between Hong Kong Geodetic Coordinates System (ITRF96) and Macao Geodetic Coordinates System (ITRF2005)

Name of Parameter Set: 7P_HK_Macao_2012 (Date: 23 Aug, 2012)

Datum Transformation Parameters:

	From : Macao Geodetic Coordinates (ITRF2005) To : Hong Kong Geodetic Coordinates (ITRF96)	From : Hong Kong Geodetic Coordinates (ITRF96) To : Macao Geodetic Coordinates (ITRF2005)
Shift along x-axis (dX)	0.5218 m	-0.5218 m
Shift along y-axis (dY)	0.1364 m	-0.1364 m
Shift along z-axis (dZ)	1.0864 m	-1.0864 m
Rotation about x-axis (θ_x)	0.02792 "	-0.02792 "
Rotation about y-axis (θ_y)	0.01162 "	-0.01162 "
Rotation about z-axis (θ_z)	-0.00796 "	0.00796 "
Scale factor (S)	-0.0459 ppm	0.0459 ppm

Datum Transformation Equation:

$$\begin{bmatrix} X \\ Y \\ Z \end{bmatrix}_{\text{new}} = \begin{bmatrix} dX \\ dY \\ dZ \end{bmatrix} + \begin{bmatrix} (1+S) & \theta_z & -\theta_y \\ -\theta_z & (1+S) & \theta_x \\ \theta_y & -\theta_x & (1+S) \end{bmatrix} \begin{bmatrix} X \\ Y \\ Z \end{bmatrix}_{\text{old}}$$

Where

dX : Shift along x-axis
dY : Shift along y-axis
dZ : Shift along z-axis
 θ_x : Rotation about x-axis
 θ_y : Rotation about y-axis
 θ_z : Rotation about z-axis
S : Scale factor

$\begin{bmatrix} X \\ Y \\ Z \end{bmatrix}_{\text{new}}$: 3D Cartesian Coordinates in New Geodetic Datum
 $\begin{bmatrix} X \\ Y \\ Z \end{bmatrix}_{\text{old}}$: 3D Cartesian Coordinates in Old Geodetic Datum

Numerical Data for Checking the Transformation Computation

Users can use the following data to verify the formulae and parameters used.

Macao 3D Cartesian Coordinates (ITRF2005)	Hong Kong 3D Cartesian Coordinates (ITRF96)
X : -2362038.3421 m Y : 5417429.2380 m Z : 2390772.8120 m	X : -2362038.0556 m Y : 5417429.3582 m Z : 2390772.9223 m

Enquiry about the transformation parameters can be made to:

Geodetic Survey Section, Survey and Mapping Office, Lands Department

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