

Hands-on-exercises 2015-12-17:

1. Coordinate Transformation

- 1.1 Select all Gauß Krüger reference systems based on the 'Deutsches Haupt Dreiecks Netz' DHDN (First Order Triangulation Network) using the information stored in table SDO_COORD_REF_SYS.

- 1.2 Create a table GEOTEST containing the two attributes:

IDtest as primary key and
geom of datatype SDO_GEOMETRY.

Now insert the following coordinates and add them to the GEOTEST table. Which reference system is used ?

R=4589912.66017652 H=5820737.08691974
R=4589921.53102206 H=5820649.65136422
R=4590132.10165090 H=5820676.56064716
R=4590118.96253121 H=5820763.24958736

Take care to apply the correct spatial reference ID (SRID) and don't forget to update the metadata table!

- 1.3 Transform the coordinates from GK Zone 4 to GK Zone 3 !
- 1.4 Calculate the distance from the first point listed in 1.2 to the equator, compare it with the distance in GK Zone 3 and calculate the difference. Explain the result.
- 1.5 Select all 2D reference systems based on WGS 84.
- 1.6 Transform the coordinates used in 1.2 from GK Zone 4 to geographic coordinates (WGS 84) and locate the calculated position in Google Earth.

Homework

1. Your GPS receiver displays the geographic coordinates $\lambda = 13^\circ 20' 34''$, $\varphi = 52^\circ 30' 34''$ (WGS 84). Calculate the distance from your position to the Main Building of the Technical University with the Gauß Krüger (GK)-coordinates $R=4589981.76$ m and $H=5820715.67$ m.
2. Insert a rectangle into table GEOTEST defined by the corners $\lambda = 12^\circ$, $\varphi = 52^\circ$ and $\lambda = 13^\circ$, $\varphi = 53^\circ$ (WGS 84).
3. Calculate the area of this rectangle.
4. Transform the rectangle into GK Zone 4 (DHDN) and calculate the area.
5. Now transform the mesh into GK Zone 3 (DHDN) and calculate the area again. Probably you are surprised to obtain different results. Try to explain this effect.

Deadline: Jan 07, 12 am – please upload your homework to ISIS.