ISO Geodetic Registry

Item class Transformation

Name KSA-GRF17 to KSA-VRF14 [GASGI v1]

Item status VALID
Identifier 782

Alias KSA-GEOID17

Information source Title Technical Summary for Saudi Arabia National

Spatial Reference System (SANSRS).

Author General Directorate of Geodesy

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Data source ISO Geodetic Registry

Remarks Hybrid geoid grid transformation with resolution 0.02 deg lat x 0.025

deg Ion. Accuracy is ~2 cm in Eastern region and ~10-20 cm in rest of KSA. The hybrid grid is based on a gravimetric geoid fitted to KSA-VRF14 through a set of 280 GPS/levelling points. To obtain access to the KSA-GEOID17 grid file, contact GASGI at info@gasgi.gov.sa. The

grid file also available in IGN2009 format.

Operation version GASGI v1

Scope Spatial referencing

Operation accuracy 0.2 m

Source CRS KSA-GRF17 - LatLonEHt

Target CRS KSA-VRF14 - OHt

Operation method Geographic3D to Gravity Related Height (GRAVSOFT)

Extent

Description	Saudi Arabia - onshore.	
Geographic Bounding Box	West-bound longitude	34.51
	North-bound latitude	32.16
	East-bound longitude	55.67
	South-bound latitude	16.37

Operation parameter values

Geoid (height correction) model file KSA-GEOID17.gra

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Item class OperationMethod

Name Geographic3D to Gravity Related Height

(GRAVSOFT)

Item statusVALIDIdentifier774

Data source ISO Geodetic Registry

Remarks This transformation involves the application of a geoid-ellipsoid

separation value interpolated from a geoid or quasigeoid model in the GRAVSOFT grid format. The model provides separation values at the nodes on a regular grid of latitude and longitude intersection points. The geodetic latitude and longitude used to interpolate within the grid are not affected by this transformation. The grid is referenced to the horizontal subset of the geographic CRS (the source CRS) and

interpolation must be made in this system.

Formula The gravity-related height (H) in the target vertical CRS is then

obtained from the height above the ellipsoid (h) in the source geographic 3D CRS using: H = h - N where N is the geoid-ellipsoid separation relative to the ellipsoid of the source Geographic 3D CRS. The separation N is calculated through a bi-linear interpolation of the

grid using the latitude and longitude of the point.

Operation parameters

Geoid (height correction) model file