

# ISO Geodetic Registry

<i>Item class</i>	Transformation	
<i>Name</i>	<b>KSA-GRF17 to KSA-VRF14 [GASGI v1]</b>	
<i>Item status</i>	VALID	
<i>Identifier</i>	782	
<i>Alias</i>	KSA-GEOID17	
<i>Information source</i>	<i>Title</i>	Technical Summary for Saudi Arabia National Spatial Reference System (SANSRS).
	<i>Author</i>	General Directorate of Geodesy
	<i>Publisher</i>	General Directorate of Geodesy, General Authority for Survey and Geospatial Information, Kingdom of Saudi Arabia
	<i>Publication date</i>	2019-06
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	<i>Other citation details</i>	<a href="https://www.gasgi.gov.sa/En/Products/Products_v1/Geodesy/Documents/Technical_Summary_for_SANSRS_v1.1.pdf">https://www.gasgi.gov.sa/En/Products/Products_v1/Geodesy/Documents/Technical_Summary_for_SANSRS_v1.1.pdf</a> (accessed 2021-06-07)
<i>Data source</i>	ISO Geodetic Registry	
<i>Remarks</i>	Hybrid geoid grid transformation with resolution 0.02 deg lat x 0.025 deg lon. 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.	
<i>Operation version</i>	GASGI v1	
<i>Scope</i>	Spatial referencing	
<i>Operation accuracy</i>	0.2 m	
<i>Source CRS</i>	KSA-GRF17 - LatLonEHt	
<i>Target CRS</i>	KSA-VRF14 - OHt	
<i>Operation method</i>	Geographic3D to Gravity Related Height (GRAVSOFT)	

## Extent

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

## Operation parameter values

<i>Geoid (height correction) model file</i>	KSA-GEOID17.gra
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<i>Item class</i>	OperationMethod
<i>Name</i>	<b>Geographic3D to Gravity Related Height (GRAVSOF)</b>
<i>Item status</i>	VALID
<i>Identifier</i>	774
<i>Data source</i>	ISO Geodetic Registry
<i>Remarks</i>	This transformation involves the application of a geoid-ellipsoid separation value interpolated from a geoid or quasigeoid model in the GRAVSOF 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.
<i>Formula</i>	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*