

Description of Files Containing Propagated Error Estimates From EGM2008 on Global 5'×5' Grids

File Content and Structure

The EGM2008 propagated standard deviations corresponding to point values of Free-air Gravity Anomalies (Δg), point values of Height Anomalies/Geoid Undulations (ζ/N), and point values of the Deflection of the Vertical (DoV) components ($\xi - \xi_i$) and ($\eta - \eta_i$) are provided in the following four files. In all cases the values refer to the surface of the reference ellipsoid (i.e., $h = 0$), and represent the spectral bandwidth from harmonic degree 2, to harmonic degree and order 2159, since this is the spectral bandwidth associated with the 5'×5' gravity anomaly data that were used in the development of EGM2008. The estimation of these propagated errors was performed using the technique described by [Pavlis and Saleh, 2005]. A copy of this paper is available on-line at:

http://earth-info.nima.mil/GandG/wgs84/gravitymod/new_egm/EGM08_papers/Error_Prop_paper_final.pdf

The following four gridded data files are sequential, unformatted, binary files containing REAL*4 values (see the “read_4files_min05” program for details on their structure). The data are stored one latitude row per record (from North to South), and within each row from West to East. In these 5'×5' files the first row has latitude 90°-2.5', and the first column has longitude 2.5' East, i.e., the registration of the data values corresponds to the center of the cell.

The data files were created on a computer that uses **BIG ENDIAN** internal binary representation. Each of the following four data files contains **37342080** bytes in total. The statistics of the values in these four files are given next.

(1) Dg_sig.s2-2159.Dg=v032608b.wt=v032308a.mGal_5

Propagated Δg Standard Deviation (mGal)

Number of Values	9331200
Percentage of Area	100.000
Minimum Value	0.799
Latitude of Minimum	49.875
Longitude of Minimum	307.458
Maximum Value	89.779
Latitude of Maximum	-83.875
Longitude of Maximum	168.375
Arithmetic Mean	6.092
Area-Weighted Mean	4.409
Arithmetic RMS	9.619
Area-Weighted RMS	6.564
Arithmetic S.Dev.	7.445
Area-Weighted S.Dev.	4.863

(2) **N_sig.s2-2159.Dg=v032608b.wt=v032308a.cm_5**

Propagated ζ/N Standard Deviation (cm)

Number of Values	9331200
Percentage of Area	100.000
Minimum Value	3.045
Latitude of Minimum	54.542
Longitude of Minimum	0.125
Maximum Value	102.194
Latitude of Maximum	-84.042
Longitude of Maximum	167.042
Arithmetic Mean	10.925
Area-Weighted Mean	8.450
Arithmetic RMS	15.749
Area-Weighted RMS	11.137
Arithmetic S.Dev.	11.344
Area-Weighted S.Dev.	7.255

(3) **xi_sig.s2-2159.Dg=v032608b.wt=v032308a.asec_5**

Propagated ξ DoV Standard Deviation (arc-second)

Number of Values	9331200
Percentage of Area	100.000
Minimum Value	0.133
Latitude of Minimum	30.458
Longitude of Minimum	278.875
Maximum Value	11.423
Latitude of Maximum	-83.958
Longitude of Maximum	168.208
Arithmetic Mean	0.913
Area-Weighted Mean	0.659
Arithmetic RMS	1.438
Area-Weighted RMS	0.979
Arithmetic S.Dev.	1.111
Area-Weighted S.Dev.	0.724

(4) `eta_sig.s2-2159.Dg=v032608b.wt=v032308a.asec_5`

Propagated η DoV Standard Deviation (arc-second)

Number of Values	9331200
Percentage of Area	100.000
Minimum Value	0.129
Latitude of Minimum	49.875
Longitude of Minimum	307.375
Maximum Value	11.203
Latitude of Maximum	-84.042
Longitude of Maximum	167.375
Arithmetic Mean	0.914
Area-Weighted Mean	0.663
Arithmetic RMS	1.438
Area-Weighted RMS	0.981
Arithmetic S.Dev.	1.110
Area-Weighted S.Dev.	0.723

Program to Read the Global 5'×5' Files and Compute Statistics

(1) `read_4files_min05`

FORTTRAN program that can be used to read files (1), (2), (3) and (4) above. The program also computes statistics of the values in each file.

(2) `read_4files_min05.out01`

Output from a run of the above program (1).

Reference

Pavlis, N.K. and J. Saleh (2005). Error propagation with geographic specificity for very high degree geopotential models, IAG Symposia, Vol. 129, Jekeli et al. (Eds.), Gravity, Geoid and Space Missions, Springer-Verlag, Berlin.