



Global maps of the ellipsoidal corrections to gravity disturbances and gravity anomalies computed using the EGM2008 global geopotential model

Robert Tenzer (1), Abdalla Ahmed (1), Pavel Novák (2,3)

(1) School of Surveying, Faculty of Sciences, University of Otago, 310 Castle Street, Dunedin, New Zealand (robert.tenzer@otago.ac.nz), (2) University of West Bohemia, Department of Mathematics, Univerzitní 8, 306 14 Pilsen, Czech Republic, (3) Research Institute of Geodesy, Topography and Cartography, Department of Geodesy and Geodynamics, Zdíby 98, Czech Republic

When the linearized boundary-value problems of physical geodesy are formulated in spherical approximation, the ellipsoidal corrections are commonly applied to observed gravity disturbances and gravity anomalies. The ellipsoidal correction is applied to observed gravity disturbances in order to reduce the vectors of actual and normal gravity to the geocentric radial direction. The complete ellipsoidal correction to observed gravity anomalies consists of two corrections, namely the ellipsoidal correction to the gravity disturbance and the ellipsoidal correction for the spherical approximation. In this study, we compile global maps of the ellipsoidal corrections to gravity disturbances and gravity anomalies. The ellipsoidal corrections are computed using the EGM2008 global geopotential model complete to degree 360 of the spherical harmonics. The EGM2008 ellipsoidal corrections are compared with the results obtained using the EGM96 global geopotential model. All the computations are realized on a 1×1 arc-deg grid at the Earth's surface. The results reveal that the ellipsoidal correction to the gravity disturbance computed using the EGM2008 coefficients complete to degree and order of 360 globally varies from -0.422 to 0.462 mGal. The corresponding ellipsoidal correction for the spherical approximation globally varies from -0.171 to 0.141 mGal. The absolute maxima of differences between the ellipsoidal corrections computed using the EGM2000 and EGM96 regionally reach several dozens of microgals.