



Combination of heterogeneous geodetic data in detailed gravity field modelling

J. Kostelecky (1,2), R. Machotka (3), and J. Simek (1)

(1) Research Institute of Geodesy, Topography and Cartography, Geodetic Observatory Pecny, Ondrejov, Czech Republic (kost@fsv.cvut.cz), (2) Department of Advanced Geodesy, FCE Czech Technical University in Prague, Thakurova 7, CZ 166 29 Praha, Czech Republic, (3) Department of Geodesy, FCE TU Brno, Veveri 95, CZ 600 00 Brno, Czech Republic

In this study a detailed gravity field is represented by the disturbing gravity potential and its first and higher order derivatives. These characteristics play an important role in geodesy providing a link between geometric and gravity space, but, under certain conditions, they can also contribute to structural interpretations of geodynamic phenomena. Their estimates are based on a combination of different observables coming from high degree/order harmonic expansion of the EGM08 earth gravitational model (2160/2160), from a large number of directly observed astronomical coordinates, GNSS/levelling based height anomalies as well as from an extremely detailed anomalous gravity field description by point gravity anomalies. Computations are performed for two test areas located in central Moravia, the Czech Republic. Accuracy assessment and investigations towards contributions of the terrestrial gravity data are accomplished by reflections about an optimal distribution of observables.