



Evaluation of EIGEN-6C4 by means of various functions of the gravity potential, and by GPS/Leveling

Jaroslav Klokocnik (1), Jan Kostelecky (2), Blazej Bucha (3), Ales Bezdek (1), and Christoph Foerste (4)

(1) Academy of Sciences of the Czech Republic, Astronomical Institute, Ondrejov, Czech Republic (jklokocn@asu.cas.cz),
(2) Research Institute of Geodesy, Topography and Cartography (VÚGTK), CZ – 250 66 Zdiby and TU Ostrava, CZ – 708 33 Ostrava-Poruba, Czech Republic, EU, (3) Department of Theoretical Geodesy, Faculty of Civil Engineering, Slovak University of Technology in Bratislava (STU), SVK – 813 68 Bratislava, Slovak Republic, EU, (4) GFZ Potsdam, Dept. Geodesy and Remote Sensing, Telegrafenberg, D – 14473 Potsdam, Germany

The combined gravity field model EIGEN-6C4 (Foerste et al., 2014) is the latest combined global gravity field model of GFZ Potsdam and GRGS Toulouse. EIGEN-6C4 has been generated including the satellite gravity gradiometry data of the entire GOCE mission (November 2009 till October 2013) and is of maximum spherical degree and order 2190. In this study EIGEN-6C4 has been compared with EGM 2008 to its maximum degree and order via gravity disturbances, the Marussi tensor of the second derivatives of the disturbing potential, the invariants of the gravity field, their specific combinations, strike angles and virtual deformations over the whole world. The emphasis is put on such areas where GOCE data (complete set of gradiometry measurements after reductions) in EIGEN-6C4 obviously contributes to an improvement of the gravity field description.

GNSS/Leveling geoid heights are independent data source for the evaluation of gravity field models. Therefore, we use the GNSS/Leveling data sets over the territories of several countries in Europe, Brazil, the USA, Canada and Japan for the evaluation of EIGEN-6C4 w.r.t. EGM 2008.