Geophysical Research Abstracts
Vol. 19, EGU2017-3632, 2017
EGU General Assembly 2017

Spectral combination of spherical gravitational curvature boundary-value problems

Martin Pitonak (1), Mehdi Eshagh (2), Michal Šprlák (3), Robert Tenzer (1), and Pavel Novák (1)

(1) NTIS - New Technologies for the Information Society, Plzeň, Czech Republic (pitonakm@ntis.zcu.cz), (2) Hogskolan Vast, Department of Engineering Science, Trollhattan, Sweden, (3) University of Newcastle, School of Engineering, Australia

The spherical gravitational curvature boundary-value problems are defined for four combinations of gravitational curvatures, i.e. components of the third-order gravitational tensor. In this contribution we discuss the determination of the Earth's disturbing gravitational potential from boundary condition in form of satellite gravitational curvature tensor (third-order gravitational tensor), particularly addressing the problem of merging these solutions based on applying the spectral combination. For this purpose, integral estimators of biased- and unbiased-types are derived and applied to recover the disturbing gravitational potential from the gravitational curvatures based on solving the spectral combination of spherical gravitational curvature boundary-value problems. In numerical studies we investigate a performance of developed models in context of regional gravitational field modelling.