Geophysical Research Abstracts
Vol. 13, EGU2011-9674, 2011
EGU General Assembly 2011

A spectral modelling of the gravitational contribution of the far-zone topography

Robert Tenzer (1), Abdalla Ahmed (1), Pavel Novak (2), Peter Vajda (3), and Artu Ellmann (4)

(1) National School of Surveying, Division of Science, University of Otago, 310 Castle Street, Dunedin, New Zealand, (2) Research Institute of Geodesy, Topography and Cartography, Geodesy and Geodynamics, Zdiby, Czech Republic, (3) Geophysical Institute, Slovak Academy of Sciences, Dúbravská cesta 9, Bratislava, Slovak Republic, (4) Department of Civil Engineering, Tallinn University of Technology, Tallinn, Estonia

A spectral representation of the topographic corrections to gravity field quantities is formulated in terms of spherical height functions. When computing the far-zone contributions to the topographic corrections, various types of the truncation coefficients are applied to a spectral representation of Newton's integral. In this study we utilise Molodensky's truncation coefficients in deriving the expressions for the far-zone contributions to topographic corrections. The expressions for computing the far-zone gravity field contributions corrected for the effect of topography are then obtained by combining the expressions for the far-zone contributions to the gravity field quantities and to the respective topographic corrections, both expressed in terms of Molodensky's truncation coefficients. The numerical examples of the far-zone contributions to the topographic corrections and to the topography-corrected gravity field quantities are given over the study area situated in the Canadian Rocky Mountains with adjacent planes. Coefficients of the global elevation and geopotential models are used as the input data.