Geophysical Research Abstracts,
Vol. 10, EGU2008-A-11754, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-11754
EGU General Assembly 2008

An iterative Lagrangian approach to Sea Surface Topography and marine geoid computations following exactly the definition of the geoid according to Gauss and Listing

R. Karimi, A. A. Ardalan

Department of Surveying and Geomatics Engineering, Center of Excellence in Surveying Engineering and Disaster Prevention, Faculty of Engineering, University of Tehran, P. O. Box: 11155-4563, Tehran-Iran, (rkarimy@ut.ac.ir) (ardalan@ut.ac.ir)

In this paper following exactly the definition of the geoid according to Gauss and Listing, as an equipotential surface that best fits to global Mean Sea Level (MSL), we have constructed a new iterative methodology for SST and marine geoid computations based on satellite altimetry derived MSL. Indeed, since MSL minus SST is the geoid the condition of having minimum sum of squares of SST values over the global sea areas is satisfied by Lagrangian minimization approach, taking the equality of the gravity potential for all the points on the geoid as the constraints. Using the KMS04 as the input MSL model, and EGM96 as the global reference potential field, a global solutions for SST and marine geoid are computed over a $2^\circ \times 2^\circ$ grid. The computed SST is compared with POCM-4B model developed by R. Rapp from Ohio State University. The RMS of the differences between the two models is estimated as 10.2 cm, which shows high consistency of the computed SST based on our approach with that of POCM-4B. Therefore, we can conclude that our approach can be considered as on alternative method for SST and marine geoid computations directly from MSL and geopotential models.