Geophysical Research Abstracts
Vol. 20, EGU2018-6984, 2018
EGU General Assembly 2018

The finite volume method for solving the altimetry-gravimetry boundary-value problem.

Marek Macák, Róbert Čunderlík, Karol Mukula, and Zuzana Minarechová

Slovak University of Technology, Faculty of Civil Engineering, Department of Mathematics and Descriptive Geometry, Bratislava, Slovakia

The numerical methods such as the finite volume method (FVM) can be easily implemented for global and local gravity field modelling. In our approach, we define and discretize the 3D computational domain between an ellipsoidal approximation of the Earth's surface and an upper boundary at the mean altitude of the GOCE orbits. In order to obtain precise numerical solution, we use a very refined discretization that leads to large-scale computations. An optimal parallel implementation of FVM together with large-scale computations using parallel technic (MPI or OpenMP) and domain decomposition method on clusters with distributed memory allow such a high-resolution modelling. Presented numerical experiments deal with the modelling of the altimetry-derived gravity disturbances over oceans.