

SC 2.4a: European Gravity and Geoid

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Terms of Reference

The primary objective of the sub-commission is the development of improved regional gravity field models (especially geoid/quasigeoid) for Europe which can be used for applications in geodesy, oceanography, geophysics and engineering, e.g., height determination with GNSS techniques, vertical datum definition and unification, dynamic ocean topography estimation, geophysical modelling, and navigation.

The modelling will be based mainly on terrestrial gravity and terrain data in combination with the latest available global geopotential models. In this context, the upgrade of the terrestrial data sets as well as the inclusion of the CHAMP and GRACE based global geopotential models lead to significant improvements. The evaluation of the present European Gravimetric Geoid 2008 (EGG2008) by GNSS and levelling data indicates an accuracy potential of 1 – 3 cm on a national basis, and 2 – 5 cm at continental scales, provided that high quality and resolution input data are available within the area of interest. Further improvements are expected from the utilization of the GOCE based geopotential models as well as from further upgrades of the terrestrial data base.

Structure

The regional sub-commission for Europe SC2.4a has national delegates from most of the countries in Europe and reports to sub-commission 2.4. The existing contacts and successful cooperation with the respective delegates and national and international agencies shall be continued and extended.

Program of Activities

- Utilization of new geopotential models based on the GOCE mission.
- Identification and acquisition of new terrestrial data sets including gravity, terrain, and GPS/levelling data.
- Merging and validation of all data sets.
- Refinement of the mathematical modelling and numerical tests.
- Investigation of different data combination approaches.
- Computation of new geoid and quasigeoid models.
- Evaluation of the results by GNSS/levelling data.
- Study of applications, such as vertical datum definition and unification, dynamic ocean topography estimation, etc.