



EUREF and GRAVITY

**Should earth gravity field related works become a part of EUREF?
Should EUREF be enhanced by gravity matters as a necessary
supplement to the vertical?**

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Gravity in IAG structure 1987 - 1995

- Section III - Determination of the Gravity Field
- International Gravity Commission
- International Geoid Commission
- Bureau Gravimétrique International
- since 1991 SSG 3.133 - Techniques of Precise gravimetry (until 1995)
- 1995 - WG2 - World Gravity Standards, WG6 - Intercomparison of AG, WG7 - Global Gravity Monitoring Network, WG8 - Relative Gravity Network for 1997 AG Intercomparison

Gravity in IAG Structure 1999 - 2003

- 1999: International Services - BGI, IGeS
- Commission XIII - $I_{\text{G}}^{\text{G}}\text{S}$
- WG on Intercomparison of Absolute Gravimeters
- 2003: Commission 2 - Gravity Field: ... SC2.1 - Gravimetry and Gravity Networks; CP2.1 - European Gravity and Geoid; IC-P1.2: Vertical Reference Frames

IAIG Sub-Commission 2.1

Gravimetry and Gravity Networks

Promotes scientific investigations of gravimetry and gravity networks by employing three step strategy:

- AG gravity determination at selected sites - point scale
- point wise gravimetry $\Rightarrow$ 1D gravimetry (airborne)
- special absolute/relative gravity campaigns to adjust the results of gravity surveys on regional scale

IAG Commission 1 - Reference Frames

Sub-Commission 1.3a Europe (EUREF)

Program of Activities

- Continue to develop EPN
- Extend UELN
- Implement ECGN
- Consider the contribution to IGGOS
- etc.

All these activities are inherently related to gravity field, although the main objective of EUREF is defining, realizing and maintaining reference frame (s) for positioning in geometric and gravity space

IAG Commission 3

Geodynamics and Earth Rotation

- SC 3.1 - Earth Tides: WG 3.1.3 - Analysis of environmental data for the interpretation of gravity measurements
- IC-P1.1 - Global Geodynamics Project (GGP) - joint with the Commission 2 : phase 1 July 1, 1997 - July 1, 2003; phase 2 July 1, 2003 - July 1, 2007
- GGP ToR: To record the Earth's gravity field with high accuracy at the number of worldwide stations using SGs; an important requirement is the frequent monitoring of absolute gravity at each site to co-determine secular changes; in phase 2 SGs are deployed in regional arrays for limited time periods
- GGP monitors changes in the Earth's gravity field at periods of seconds and longer
- GGP indicates application of gravity data to the solution of a number of geodynamic problems

Object vs Methodology Oriented Approach

- Is determination of characteristics of the earth's gravity field and their time variations really one of the main objectives of EUREF activities?
- Methodology of determination of the characteristics of the EGF is subject to the activities of specialized IAG commissions
- The main contribution of EUREF could be in co-locations and mainly in realization

Conclusions (1)

- If one of the current EUREF objectives - development of the ECGN - should be met, it is not necessary to revise the competences within the present IAG structure but to employ one of the most effective tools of the EUREF Subcommision - ability to initiate, organize and realize concerted actions to achieve a specific goal
- To achieve this goal, EUREF should benefit from methodological achievements of other parts of the IAG structure
- A concerted action towards ECGN realization is demanding on resources; a corresponding administration background should be developed

Conclusions (2)

Recently an initiation of a new action has been announced - its preliminary title is „Post-UNIGRACE Project“ (UNIGRACE was probably the last coordinated multi-lateral European project in the field of absolute gravimetry aimed at the unification and development of the gravity systems of the Central- and East European countries;

The response to this new initiative has been up-to-now rather limited, but basically positive; however, the following aspect was stressed:

- the project should follow the concept represented by the current IAG programme IGGOS and/or its sub-project ECGN.**