

Minutes of the 1st Meeting of the Working Group on Absolute Gravity

Place: Chania, Crete

Time: 24.06.2008, 18:30 to 20:00 h

Introduction

H. Wilmes opened the meeting with a short overview of the development and the establishment of the working group. Preparation started in Istanbul 2006 during the IGFS Symposium about the necessity of a working group which brings together the community of absolute gravimeter users, improves the benefit of existing and future data and enables combination with other geodetic and geophysical observations. The topic was resumed in St. Petersburg in 2007 during the meeting of the “Consultative Committee on Mass and Related Quantities, WGG” and the “IAG SG on Comparisons of Absolute Gravimeters”.

The Working Group on Absolute Gravity was established in 2007; the conventions are documented in the IAG Geodesist's handbook. A first circular letter was sent to potential participants. These are users of absolute gravimeters and additionally interested persons. About 80 persons expressed their interest to participate in the work and discussion or at least to be informed about the further developments.

Presentations

Presentations were provided to explain the intended subjects of the working group and to initiate further discussion and initiatives:

H. Wilmes presented an overview of the motivation and the main subjects which could be covered by the activities of the working group. In the near future these would be the development of standards for the determination of absolute gravity values, the establishment of a database for absolute gravity, the design of a global gravity reference network and the improved cooperation of the absolute gravity community with the Global Geodynamics Project (GGP).

S. Bonvalot described the contribution of the International Gravimetric Bureau (BGI) and the implementation of the new database “AGrav” for absolute gravity data at BGI and BKG as mirror sites.

H. Wziontek presented some details about the new database AGrav, the data structure, user interface and the mechanism for uploading absolute gravity observations.

D. Crossley gave an overview of the benefit the AG database could provide for the GGP project. He proposed establishing a link to the GGP project for the combination of absolute gravity data with superconducting gravity registrations. Remarks on the data policy were added.

The four presentations are enclosed as pdf-files

Discussion

A discussion took place about the appropriate use of terminology specifying the observation error budget. Different views were voiced:

A. Germak commented that only “uncertainty” is a relevant measure in absolute gravity.

L. Vitushkin confirmed the need to introduce metrological standards in gravimetry. Calibrated (by comparison) and un-calibrated instruments should be distinguished, primary standards must be ensured and offsets obtained from International (BIPM) and regional comparisons can be applied to the measurement results.

J. Mäkinen suggested distinguishing between the realization of free fall as a problem of metrology and the time varying gravity field as subject of geodesy (example: different models for atmospheric

loading) and emphasized the value of drop data as a basis of long term consistency with respect to reprocessing with unique correction models.

L. Vitushkin expressed his viewpoint that no discrepancy should exist btw. metrological and geodetic aspects of absolute gravimetry and that the comparison of AG includes both aspects, since gravity is subject to change during respective observation periods as well.

Contributions to working group and database

Several members expressed their position regarding the support of the working group and their intended contribution to the absolute gravity database:

D. Smith explained that NGS has been following its gravity program (SG and AG) for a long time and will be willing to contribute data to the database.

D. Ruess offered contributing as many data as possible from 21 years of absolute gravity measurements with Jilag instruments and recommended the storage of primary observations (raw or corrected drop data) to be able to reprocess with consistent models, especially with respect to long time studies.

H. Wziontek explained that several methods for insertion of new data into gravity database exist, web upload of project files is only one possibility. Especially in the case of a larger amount of data, more efficient solutions can be jointly evaluated.

J. Ihde expressed the importance of exact station coordinates with respect to future combination with the vertical reference frame and other observation methods (GNSS).

H. Wilmes pointed out the importance of the height component for separation of mass changes from vertical movements.

M. Mojzes requested enhanced correction models below 1 μ gal level for consistent gravity determination.

D. Crossley expressed that hydrological corrections are still a challenge; currently no models exist with the required accuracy.

Continuation of work

Herbert Wilmes

Participants:

Ågren, Jonas	Lantmäteriet, Sweden
Amalvict, Martine	IPGS/EOST, Strasbourg, France
Bilker Koivula, Mirjam	FGI, Finland
Boedecker, Gerd	BEK, Germany
Bonvalot, Sylvain	BGI/IRD, France
Chen, Jianli	Univ. of Texas, Austin, U.S.A.
Childers, Vicki	NOAA / National Geodetic Survey, U.S.A.
Crossley, David	EAS Saint Louis University, U.S.A.
Drewes, Herrmann	DGFI, Germany
Evraerts, Michel	ROB, Belgium
Francis, Olivier	University of Luxembourg
Gerlach, Christian	Norwegian University of Life Sciences, UMB, Norway
Germak, Alessandro	INRIM, Italy
Holota, Petr	Res. Inst. Geodesy, Czech Republic
Ihde, Johannes	BKG, Germany
Jiang, Z.	BIPM, France
Kroner, Corinna	GFZ Potsdam, Germany
Mäkinen, Jaakko	FGI, Finland
Merlet, Sebastien	LNE-SYRTE, Observatoire de Paris, France
Mojzes, Marcel	SUT Bratislava, Slovakia
Müller, Jürgen	Leibniz-Univ. Hannover, Germany

Omang, Ove Christian	Norwegian Mapping and Cadastre Authority, Norway
Palinkas, Vojtech	VUGTK-GO Pecny, Czech Republic
Rotsalainen, Hannu	FGI, Finland
Ruess, Diethard	BEV, Austria
Sanchez, Laura	DGFI, Germany
Schäfer, Uwe	BKG, Germany
Smith, Dru	NOAA / National Geodetic Survey, U.S.A.
Smith, Victoria	NERC Space Geodesy Facility, U.K.
Strykowski, Gabriel	DTU Space, Denmark
Sun, Wenke	Univ. Tokyo, Japan
Svitlov, Sergiy	MPG-IOIP-II, Erlangen, Germany
Szimek, Jaroslav	RIGTC-GD Pecny, Czech Republic
Tõnis Oja	Estonian Land Board, Estonia
Vituskin, Leonid	BIPM, France
Wilmes, Herbert	BKG, Germany
Wilson, Clark	Univ. of Texas, Austin, U.S.A.
Wziontek, Hartmut	BKG, Germany