

## Joint Working Groups of Sub-Commission 2.1

### JWG 2.1.1: Establishment of a global absolute gravity reference system

(joint with IGFS, IGETS)

Chair: Hartmut Wziontek (Germany)

Vice-chair: Sylvain Bonvalot (France)

#### Terms of Reference

One task of IAG's Commission 2 "Gravity Field" is the establishment of an absolute gravity reference system to replace the International Gravity Standardization Net 1971 (IGSN71). At the IUGG General Assembly in Prague 2015, Resolution No. 2 for the establishment of a global absolute gravity reference system was adopted by the IAG.

IAG Sub-Commission 2.1 "Gravimetry and Gravity Networks" promotes scientific investigations of gravimetry and gravity networks and terrestrial (on the land, airborne, marine) and planetary gravity measurements. One of the outputs of the SC 2.1 activities is the result of gravity measurements, i.e. the gravity data. The International Gravity Field Service IGFS coordinates the servicing of the geodetic and geophysical community with gravity field related data, software and information. A modern and precise absolute gravity reference system will not only contribute to the establishment of the Global Geodetic Reference Frame (GGRF) of UN but will serve as a long-term and precise gravity reference for GGOS, the IAG Global Geodetic Observing System.

#### Objectives

In the frame of IAG Sub-Commission 2.1 "Gravimetry and Gravity Networks" the necessary steps to realize this new reference system will now be prepared by the JWG 2.1.1. It will focus on the preparation of a roadmap for establishment of the GAGRS taking into account:

- Repeated international comparisons of absolute gravimeters under guidance of the International Committee for Weights and Measures (CIPM) and Regional Metrology organizations which define both measurement standards in gravimetry (absolute gravimeters) and absolute gravity standards for metrology and geodesy;
- A set of distributed gravity reference stations where the repeated absolute gravity measurements and the monitoring of temporal gravity changes with superconducting gravimeters for the realization of an absolute gravity reference function;

- The transfer of international comparison results to other absolute gravimeters and reference stations, as outlined in the document "CIPM – IAG Strategy for Metrology in Absolute Gravimetry";
- The definition of standard models for the correction of absolute gravity data in cooperation with the GGOS Bureau of Standards and Conventions.

The absolute gravity database "AGrav", which already became a fixed part of the BGI (International Gravimetric Bureau) services, will be used as a registry for the global absolute gravity reference system. The extension for storage and distribution of comparison results will be an essential task.

Cooperation with the new International Geodynamics and Earth Tide Service (IGETS) of IAG (former Global Geodynamics Project, GGP) should be established to realize the continuous monitoring at the gravity reference stations.

#### Members

Hartmut Wziontek, Chair (Germany), Sylvain Bonvalot, Vice-chair (France), Jonas Ågren (Sweden), Henri Baumann (Switzerland), Mirjam Bilker Koivula (Finland), Jean-Paul Boy (France), Nicholas Dando (Australia), Reinhard Falk (Germany), Olivier Francis (Luxembourg), Domenico Iacovone (Italy), Jan Krynski (Poland), Jacques Liard (Canada), Urs Marti (Switzerland), Vojtech Palinkas (Czech Republic), Diethard Ruess (Austria), Victoria Smith (UK), Ludger Timmen (Germany), Michel van Camp (Belgium), Derek van Westrum (USA), Leonid Vitushkin (Russia), Shuqing Wu (China)

#### Corresponding Members

Mauro Andrade de Sousa (Brazil), In-Mook Choi (Korea), Andreas Engfeldt (Sweden), Yoichi Fukuda (Japan), Alessandro Germak (Italy), Joe Henton (Canada), Jacques Hinderer (France), Juraj Janak (Slovakia), Shuanggen Jin (China), Janis Kaminskis (Latvia), Jeff Kennedy (USA), Jakub Kostelecky (Czech Republic), Jaakko Mäkinen, (Finland), J.N. Markiel (USA), Emil Nielsen (Denmark), Tomasz Olszak (Poland), Bjørn Ragnvald Pettersen, (Norway), Rene Reudink (The Netherlands), Jose Manuel Serna Puente (Spain), Manuel Schilling (Germany), Heping Sun (China), V.M. Tiwari (India), Christian Ullrich (Austria)