

JWG 2.1.1: Establishment of the International Gravity Reference Frame

(Joint with the IGFS, BGI and IGETS)

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Terms of Reference

One task of IAG's Commission 2 "Gravity Field" is the establishment of the International Gravity Reference System and Frame (IGRF). These activities are motivated by the IAG Resolutions No. 2 of 2015 (IUGG General Assembly Prague) and No. 4 of 2019 (IUGG General Assembly Montreal). The IAG Sub-Commission 2.1 "Land, Marine and Airborne Gravimetry" promotes consistency and compatibility of gravity and gravity gradient datasets and assessment of their accuracy. 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 frame will not only contribute to the establishment of the Global Geodetic Reference Frame (GGRF) of the UN, but will also serve as a long-term and precise gravity reference for the IAG Global Geodetic Observing System (GGOS).

Objectives

Within IAG Sub-Commission 2.1 "Land, Marine and Airborne Gravimetry" the realization of the International Gravity Reference Frame (IGRF) will be initiated. The IGRF is the implementation of the International Gravity Reference System (IGRS). The IGRS is defined by the observation of the instantaneous acceleration of free fall, the traceability of these observations to the International System of Units (SI), and a set of conventional corrections for the time independent components of gravity effects. The IGRF as the realization of the IGRS is based on observations with absolute gravimeters (AG) which are monitored at reference stations and during comparisons. The IGRF further defines a set of conventional models for the correction of temporal gravity changes. Finally, the IGRF demands a compatible infrastructure accessible to end-users.

The JWG focuses on the establishment of such infrastructure in cooperation with IGFS, GGOS, international and national institutions, agencies, and governmental bodies. This infrastructure should consist of reference stations on the national level for the monitoring of AGs. On the international level, comparison stations will provide the facilities to check the consistency of AGs within their reported uncertainty estimates, and core stations will link to space geodetic techniques and the International Height Reference Frame (IHRF).

The absolute gravity database "AGrav" which already is a fixed part of the BGI (International Gravimetric Bureau) services is proposed to serve as a central inventory to document all IGRF stations and related AG observations.

A close cooperation with the International Geodynamics and Earth Tide Service (IGETS) supports the continuous monitoring at the gravity reference stations. The collaboration with the Working Group on Gravimetry of the Consultative Committee on Mass and Related Quantities (CCM-WGG) ensures good practice in the field of AG comparisons.

The activities should be further aligned with the JWG on the Implementation of the International Height Reference Frame.

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