

International Association of Geodesy Symposia

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- Symposium 104: Sea Surface Topography and the Geoid
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- Symposium 121: Geodesy Beyond 2000: The Challenges of the First Decade
- Symposium 122: IV Hotine-Marussi Symposium on Mathematical Geodesy
- Symposium 123: Gravity, Geoid and Geodynamics 2000
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- Symposium 126: Satellite Altimetry for Geodesy, Geophysics and Oceanography
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- Symposium 128: A Window on the Future of Geodesy
- Symposium 129: Gravity, Geoid and Space Missions
- Symposium 130: Dynamic Planet - Monitoring and Understanding . . .
- Symposium 131: Geodetic Deformation Monitoring: From Geophysical to Engineering Roles
- Symposium 132: VI Hotine-Marussi Symposium on Theoretical and Computational Geodesy
- Symposium 133: Observing our Changing Earth
- Symposium 134: Geodetic Reference Frames
- Symposium 135: Gravity, Geoid and Earth Observation
- Symposium 136: Geodesy for Planet Earth
- Symposium 137: VII Hotine-Marussi Symposium on Mathematical Geodesy
- Symposium 138: Reference Frames for Applications in Geosciences
- Symposium 139: Earth on the Edge: Science for a sustainable Planet
- Symposium 140: The 1st International Workshop on the Quality of Geodetic Observation and Monitoring Systems (QuGOMS' 11)
- Symposium 141: Gravity, Geoid and Height systems (GGHS2012)
- Symposium 142: VIII Hotine-Marussi Symposium on Mathematical Geodesy
- Symposium 143: Scientific Assembly of the International Association of Geodesy, 150 Years

IGFS 2014

Proceedings of the 3rd International Gravity Field Service
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Edited by

Shuanggen Jin
Riccardo Barzaghi

Volume Editor

Shuanggen Jin
Shanghai Astronomical Observatory
Chinese Academy of Sciences
Shanghai
China

Riccardo Barzaghi
Politecnico di Milano, DICA
Piazza Leonardo da Vinci 32
Milano
Italy

Series Editor

Chris Rizos
School of Civil & Environmental Engineering
University of New South Wales
Sydney
Australia

Associate Editor

Pascal Willis
Institut national de l'Information
géographique et forestière
Direction de la Recherche
et de l'Enseignement
Marne-la-Vallée
France

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Preface

The accurate and precise estimation of the gravity field of the Earth is nowadays required in many geodetic and geophysical investigations. The recent satellite missions devoted to the observation of the gravity field of the Earth have strongly improved the resolution and precision of the estimated global geopotential models. Global mass redistributions in the Earth environment can be observed and modeled through gravity from space and can improve the knowledge of the Earth system and climate changes. A unique height system can be estimated for the whole Earth, which is fundamental in, e.g., evaluating sea level variations. The new fields also allow innovative investigations of the solid Earth giving new details of the crust and mantle and variation over time. These improvements in the estimation of the global geopotential models also require updated/new methods in modeling the higher frequency of the gravity field and denser local data coverage to achieve 1-cm geoid accuracy, which is likely to be required in a few years for practical applications. The 3rd International Gravity Field Service (IGFS) General Assembly that focused on the above issues, including methods for observing, estimating, and interpreting the Earth gravity field as well as its applications, was successfully held in Shanghai, China from June 30 to July 6, 2014.

These proceedings contain 24 peer-reviewed papers presented at the 3rd IGFS General Assembly, which was organized by the International Gravity Field Service (IGFS), Commission 2 of the International Association of Geodesy (IAG), and Shanghai Astronomical Observatory (SHAO), Chinese Academy of Sciences. The IGFS is an official IAG Service which coordinates and harmonizes the activities of other “Level 1” gravity-related services, namely, the Bureau Gravimétrique International (BGI), the International Geoid Service (IGeS), the International Center for Earth Tides (ICET), the International Center for Global Earth Models (ICGEM), and the International Digital Elevation Model Service (IDEMS). Over 130 participants from 25 countries attended this assembly. There were 80 oral papers and 30 posters presented in the 6 days of the assembly. The list of participants and paper titles can be found at the IGFS2014 website <http://202.127.29.4/meetings/igfs2014>. The scientific sessions were centered on:

Session 1 Gravimetry and Gravity Networks

Conveners: Sylvain Bonvalot and Dan Roman

Session 2 Global Geopotential Models and Vertical Datum Unification

Conveners: Michael Sideris and Jiancheng Li

Session 3 Local Geoid/Gravity Modeling

Conveners: Urs Marti and Riccardo Barzaghi

Session 4 Satellite Gravimetry

Conveners: Roland Pail and Shuanggen Jin

Session 5 Mass Movements in the Earth System

Conveners: Rene Forsberg and Shuanggen Jin

Session 6 Solid Earth Investigations

Conveners: Carla Braitenberg and Rene Forsberg

We express our gratitude to all those who have contributed to the successful 3rd IGFS General Assembly, particularly the conveners who devoted a lot of time in organizing attractive sessions

and scheduling the program of the assembly and the associate editors of these proceedings who played a leading role in the peer review process until the final acceptance for publication. Most important, sincere thanks were given to the IAG proceedings editor Dr. Pascal Willis who advanced and kept on track the publication of these proceedings. Meanwhile, we would like to thank all reviewers, who are listed in this volume as an appreciation of their dedication.

In addition, we wish to thank the local organizing committee (LOC) members of the Satellite Navigation and Remote Sensing Group, Shanghai Astronomical Observatory, Chinese Academy of Sciences, who hosted the Assembly. Beyond responsibility for the website, registration, technical support, and all kinds of other arrangements, the LOC organized a visit to the Sheshan Astronomical Observatory, including a guided tour to the astronomical museum and to the 65-m radio telescope. Shuanggen Jin and his team (Rui Jin, Guiping Feng, Attaullah Khan, Tengyu Zhang, Xuerui Wu, Andres Calabria, Xuechuan Li, Yi Yang, Fang Zou, Nasser Najibi, Yang Zhou, and Xin Zhao) have done more than their share in bringing the IGFS General Assembly to success.

Finally, we would like to gratefully thank the Springer Publisher for their processes and cordial cooperation to publish this proceeding.

Shanghai, China
Milano, Italy
July 2015

Shuanggen Jin
Riccardo Barzaghi

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Part I

Gravimetry and Gravity Networks