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The *IAG Newsletter* is under the editorial responsibility of the *Communication and Outreach Branch* (COB) of the IAG.

It is an open forum and contributors are welcome to send material (preferably in electronic form) to the IAG COB (newsletter@iag-aig.org). These contributions should complement information sent by IAG officials or by IAG symposia organizers (reports and announcements). The *IAG Newsletter* is published monthly. It is available in different formats from the IAG new internet site: <http://www.iag-aig.org>

Each *IAG Newsletter* includes several of the following topics:

- I. news from the Bureau Members
- II. general information
- III. reports of IAG symposia
- IV. reports by commissions, special commissions or study groups
- V. symposia announcements
- VI. book reviews
- VII. fast bibliography

Books for review are the responsibility of:

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General Announcements

ILRS News

The TIGO (Transportable Integrated Geodetic Observatory) SLR system, located in Concepcion Chile, is fully operational again after the devastating earthquake on February 27, 2010. The system has been continually tracking laser ranging targets since April 29 after repositioning the telescope and optical components within the laser container. The system is operated by the Bundesamt fuer Kartographie und Geodaesie (BKG) in cooperation with Chilean university partners.

The publication of the ILRS 2007-2008 Report has been completed. Interested parties who would like to receive a copy can contact the ILRS Central Bureau (ilrs-cb@lists.nasa.gov). The document is also available in PDF form from the ILRS website at: http://ilrs.gsfc.nasa.gov/reports/ilrs_reports/ilrsreport_2007.html.

CAREY NOLL
Secretary, ILRS Central Bureau

Meeting Announcements

WEGENER 2010 in Istanbul

September 14-17, 2010, Istanbul, Turkey



The 15th General Assembly of WEGENER 2010, will be hosted by Bogazici University, Istanbul, Turkey on 14-17 September 2010. The 15th Assembly of WEGENER will provide a forum for presentation, discussion, coordination and scientific support for geoscientists interested in unravelling the kinematics and mechanisms of the broad Eurasian/African/Arabian collision zone. Contributions on new aspects arising from the new satellite missions for gravity, SAR and Laser Altimetry are welcome in particular. The call for abstracts is attached and further details are also available at www.koeri.boun.edu.tr/jeodezi/wegener2010/.

All contributions will be subject to peer-review and will also be published in the formal proceedings of the WEGENER 2010. A special issue of the Journal of Geodynamics for WEGENER 2010 will be published and a limited number of papers will be invited for submission to a full refereeing process.

- Due to high levels of interest, the deadline for submitting abstracts for the WEGENER 2010 has now been extended to **5th July 2010**.
- Deadline for online registration: August 6, 2010.

HALUK OZENER
On behalf of the Organizing Committee

Updated Announcement for the 2nd General Assembly of the IGFS

September 20-22, 2010, Fairbanks, Alaska, USA

Registration is now open for the 2nd General Assembly of the IGFS - International Gravity Field Service will be held 20-22 September, in Fairbanks, Alaska, USA. Alaska has spectacular natural beauty, and exceptional geodetic and geophysical signals due to its active tectonics, volcanism, and rapid changes in the cryosphere. With the ability to measure gravity field changes by satellites (GRACE), as well as by superconducting and repeated absolute gravity, applications of gravity field information have spread from geodesy and geophysics into much broader application areas such as climate studies, glaciology and hydrology, and the meeting will pay special attention to these themes in addition to the geodetic science. Registration is

open now via our website, as is abstract submission. More information is on our website, and please email the conference email if you have problems.

Website: <http://www.gps.alaska.edu/IGFS2/>

Email: igfs2@gi.alaska.edu

JEFFREY FREYMUELLER
for the LOC

First International School on “The KTH Approach to Modeling the Geoid”

September 20-24, 2010, Istanbul, Turkey

After the successful experiences in the determinations and evaluations of precise local geoid models in different countries, we plan to arrange the First International Geoid School based on the KTH approach. (KTH is a Swedish abbreviation for Royal Institute of Technology, Stockholm, Sweden.). The school takes place on September 20-24, 2010, at, and hosted by, the Department of Geomatic Engineering, Yildiz Technical University, Istanbul, Turkey. The geoid school is lead by

Prof. Lars E. Sjöberg

Royal Institute of Technology

Division of Geodesy

Stockholm, Sweden

Head of Geoid School

Prof. Serif Hekimuglu

Yildiz Technical University

Institute of Geomatic Engineering

Istanbul, Turkey

Head of L. O. C.

Detailed information and registration form can be downloaded from the following webpage:
<http://www.infra.kth.se/geo/events/geoidschool.html>.

MOHAMMAD BAGHERBANDI
Division of Geodesy
Royal Institute of Technology (KTH)

International Doris Service Workshop 2010

October 21-22, 2010, Lisbon, Portugal

The next International DORIS Service (IDS) workshop will take place at the Lisbon International Fair in Portugal, from 21-22 October 2010.

The purpose of this workshop is to bring together representatives from all DORIS groups to share information about the network, data, products, and to perform inter-comparisons. Developments and scientific results in all aspects of the DORIS system will be highlighted. The meeting will be a forum for discussion and coordination of future activities.

The IDS workshop will be organised in conjunction with:

- The Ocean Surface Topography Science Team (OST-ST) meeting, 18-20 October 2010
- a special meeting: Towards higher resolution remote sensing of ocean dynamics and terrestrial surface waters, 21-22 October 2010

Structure of the meeting:

The IDS workshop will include thematic sessions and a splinter working session over a period of 2 days. The sessions will consist of oral presentations and posters. Among the topics to be discussed will be DORIS results with the new satellites (Jason-2 & Cryosat-2) and progress towards an operational IDS combination.

The workshop is organised by CNES and EUMETSAT.

Organising Committee:

EUMETSAT: Gabriele Kerrmann, Francois Parisot, Madeleine Pooley

CNES: Laurence Amen, Nicole Bellefond, Sophie Coutin-Faye, Pascale Ferrage (IDS)

The Scientific Committee will draw up a programme and an agenda at a later stage, according to the submitted abstracts.

Scientific Committee:

Frank G. Lemoine (chair), John Dow, Laurent Soudarin, Petr Stepanek, Pascal Willis.

Details regarding this IDS workshop as well as more general information on the two other associated meetings are posted on the conference web site <http://ostst-hydro-2010.com/>.

PASCALE FERRAGE

Observing and Understanding Earth Rotation

A Joint GGOS/IAU Science Workshop

October 25-28, 2010, Shanghai, China

The Earth's rotation, encompassing both the rate of rotation and the location of the rotation axis with respect to the Earth's crust, is not constant but changes on all observable time scales from subdaily to decadal and longer. The wide range of time scales on which the Earth's rotation changes reflects the wide variety of processes that are causing it to change, including external tidal forces, surficial fluid processes involving the atmosphere, oceans, and hydrosphere, and internal processes acting both within the solid Earth itself and between the fluid core and the solid Earth. Knowing the rotational response of the Earth to these global-scale processes allows Earth rotation measurements to be used to study them.

Measurements of the Earth's time varying rotation have been traditionally provided by optical astrometry and the space-geodetic techniques of satellite and lunar laser ranging (SLR and LLR), very long baseline interferometry (VLBI), global navigation satellite systems (GNSS), and Doppler orbitography and radio positioning integrated by satellite (DORIS). However, the launch of the GRACE twin gravity satellites in March 2002 and the densification of the global GNSS ground receiver network afford new opportunities for studying the Earth's rotation. GRACE is directly observing the effect of mass redistribution on the Earth's rotation, and the global network of GNSS ground receivers can be used to infer changes in the load acting on the Earth's surface and its effect on the Earth's rotation from observations of changes in the Earth's shape. Combining independent observations of the Earth's rotation, gravity, and shape will enable greater insight into the common processes causing them to change.

The Global Geodetic Observing System (GGOS) of the International Association of Geodesy (IAG) provides the geodetic infrastructure necessary for monitoring the Earth system, including changes in its rotation, gravity, and shape. This joint Science Workshop, organized by both GGOS and the International Astronomical Union (IAU), on Observing and Understanding Earth Rotation will be a forum for assessing our current ability to observe the Earth's time varying rotation, for assessing our current understanding of the causes of the observed variations, for assessing the consistency of Earth rotation observations with global gravity and shape observations, for exploring methods of combining Earth rotation, gravity, and shape observations to gain greater understanding of the mass load acting on the surface of the solid Earth, and for identifying improvements in the global geodetic observing system needed to further our understanding of the Earth's variable rotation.

Please visit <http://GGOS-C19.shao.ac.cn/> for more information about this exciting workshop.

RICHARD GROSS

Contentious Issues In UNCLOS – Surely Not?

The Sixth ABLOS Conference: 25-27 October 2010

The Advisory Board on the Law of the Sea (ABLOS) is a subsidiary body of the International Association for Geodesy (IAG) and of the International Hydrographic Organization (IHO). One of its mandates is to organize regular conferences that explore and clarify the interface between marine law and science.

The Sixth ABLOS Conference is scheduled for October 25-27, 2010, at the International Hydrographic Bureau in Monaco. This meeting will again gather specialists from a variety of disciplines to discuss challenges that arise in the application of marine science and technology while taking into account the juridical

requirements of the UN Convention on the Law of the Sea (UNCLOS). This year's Conference Proceedings will be added to the accumulation of 125 or so Web-accessible presentations that have been delivered at the five previous Conferences, and which address numerous aspects of state practice and jurisprudence in the Law of the Sea.

Completed manuscripts of accepted papers should be submitted no later than **August 31, 2010** to ensure inclusion in the Proceedings which will be distributed at the close of the Conference. Formatting and submission instructions are posted on <http://www.gmat.unsw.edu.au/ablos/ABLOS10Folder/PaperFormat.pdf>

A registration form can be downloaded from <http://www.gmat.unsw.edu.au/ablos/ABLOS10Folder/ABLOS2010ConfRego.pdf>

A certain number of rooms have been pre-booked at hotels in and close to Monaco. A hotel booking form can be downloaded from <http://www.gmat.unsw.edu.au/ablos/ABLOS08Folder/ABLOS2010HotelForm.doc>

Conference Organizing Committee

Conference Chairman	Chris Rizos, University of New South Wales
COC Chairman	Ron Macnab, Geological Survey of Canada (Retired)
Programme coordinators	Chris Carleton and John Brown, UK Hydrographic Office
Advisor, Geodesy	Lars Sjoberg, Swedish Royal Institute of Technology
Advisor, Hydrography	Luiz Carlos Torres, Hydrographic Service of the Brazilian Navy
Secretariat services	Steve Shipman, International Hydrographic Bureau
Communications	Sunil Bisnath, York University, and Ron Macnab, Geological Survey of Canada (Retired)

CHRIS RIZOS

IAG Sponsored Meetings

38th COSPAR Scientific Assembly

July 18-25, 2010, Bremen, Germany

URL: <http://www.cospar-assembly.org/home.php>

15th General Assembly of WEGENER 2010

September 14-17, 2010, Bogazici University, Istanbul, Turkey

URL: www.koeri.boun.edu.tr/jeodezi/wegener2010/.

IGFS2 – 2009

September 20-22, 2010, Fairbanks, Alaska, USA

The 2nd General Assembly of the IGFS - International Gravity Field Service follows the 1st IGFS symposium in Istanbul, August 2006, and the Symposium on Gravity, Geoid and Earth Observation, held in Chania, Greece, 2008, and is organized under the auspices of the International Association of Geodesy (IAG). The webpage of the symposium is <http://www.gps.alaska.edu/IGFS2/>.

IAG Commission 1 Symposium 2010: Reference Frames for Applications in Geosciences (REFAG2010)

October 4-8, 2010, IGN, France

URL: <http://iag.ign.fr/index.php?id=140>

International Doris Service Workshop 2010

October 21-22, 2010, Lisbon, Portugal

The next International DORIS Service (IDS) workshop will take place at the Lisbon International Fair in Portugal, from 21-22 October 2010. The purpose of this workshop is to bring together representatives from all DORIS groups to share information about the network, data, products, and to perform inter-comparisons. Developments and scientific results in all aspects of the DORIS system will be highlighted. The meeting will be a forum for discussion and coordination of future activities. Details regarding this IDS workshop as well as more general information on the two other associated meetings are posted on the conference web site <http://ostst-hydro-2010.com/>.

Observing and Understanding Earth Rotation

October 25-28, 2010, Shanghai, China

URL: <http://GGOS-C19.shao.ac.cn/>

IAG Related Meetings

IEEE International Geoscience and Remote Sensing (IGARSS 2010)

July 25-30, 2010, Honolulu, Hawaii

URL: <http://www.igarss2010.org/>

2010 The Meeting of the Americas

August 8-13, 2010, Foz do Iguacu, Brazil

URL: <http://www.agu.org/meetings/ja10/>

Interdisciplinary CODATA Workshop on RISK Models and Applications

August 26-27, 2010, Berlin, Germany

URL: http://www.codata-germany.org/RMA_2010/

ESA International Summer School 2010

September 1-11, 2010, Slettestrand, Denmark

URL: <http://www.munich-satellite-navigation-summerschool.org/>

First International School on "The KTH Approach to Modeling the Geoid"

September 20-24, 2010, Istanbul, Turkey

First International Geoid School on the KTH Approach will take place on September 20-24, 2010, at Yildiz Technical University, Istanbul, Turkey. Detailed information and registration form can be found on the webpage of the conference <http://www.infra.kth.se/geo/events/geoidschool.html>.

7th International Symposium on LBS & TeleCartography

September 20-22, 2010, Guangzhou, China

The 7th International Symposium on LBS & TeleCartography will be held at Spatial Information Research Center (SIRC), in the campus of South China Normal University (SCNU) on 20th - 22nd Sept, 2010, Guangzhou, China. The symposium will bring together experts from around the world to present the latest research results and developments with focus on Location Based Services in the fields of Cartography, Geoinformation, Computer Sciences, Ubiquitous and Pervasive Computing, Telecommunication, Geodesy, and Geomedia Techniques. Official Web Site: <http://www.lbs2010.org/>.

ION GNSS 2010, 23rd International Technical Meeting

September 21-24, 2010, Portland, Oregon, USA

URL: <http://www.ion.org/meetings/gnss2010cfa.cfm>

Intergeo 2010

October 5-7, 2010, Köln, Germany

URL: <http://www.intergeo.de/>

IGCP 565 Workshop 3: Separating Hydrological and Tectonic Signals in Geodetic Observations

October 11-13, 2010, Reno, Nevada, USA

URL: http://www.igcp565.org/workshops/Reno_2010/introduction.php

UN-SPIDER Bonn Workshop

October 12-14, 2010, Bonn, Germany

URL: www.un-spider.org/workshop-bonn-2010

OSTST Annual Meeting

October 18-22, 2010, Lisbon, Portugal

URL: <http://www.aviso.oceanobs.com/>

GNSS-R 2010

October 21-22, 2010, Barcelona, Spain

The 2010 Workshop on GNSS Reflectometry (GNSS-R'10) will take place in Barcelona, Spain, during 21-22 October 2010. The primary objective of these GNSS-R workshops is to provide a forum for researchers working on the different aspects and applications of the GNSS Reflectometry where to review recent advances and to identify required improvements.

Please visit <http://congress.cimne.com/gnss-r10/> for more information on this GNSS-R'10 Workshop.

2010 ABLOS Conference

October 25-27, 2010, International Hydrographic Bureau, Monaco

An international conference on "Contentious Issues in UNCLOS - Surely Not?", will be organised by ABLOS, in Monaco, at the International Hydrographic Bureau, on 25-27 October 2010.

URL: <http://www.gmat.unsw.edu.au/ablos/index.html#ABLOS10>

ACM SIGSPATIAL GIS 2010

November 2-5, 2010, San Jose, CA, USA

The 18th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems provides a forum for original research contributions covering all conceptual, design, and implementation aspects of GIS ranging from applications, user interfaces, and visualization to storage management and indexing issues. This conference is the premier annual event of the ACM Special Interest Group on Spatial Information (ACM SIGSPATIAL). URL: <http://acmgis2010.cs.ucsb.edu/>.

IWGS 2010

November 2, 2010, San Jose, CA, USA

1st International Workshop on GeoStreaming (IWGS2010) is to be held in conjunction with the 18th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL GIS 2010).

URL: <http://infolab.usc.edu/iwgs10/>

Second SIRGAS School on Reference Systems

November 8-10, 2010, Lima, Peru

URL: <http://www.sirgas.org>

SIRGAS 2010 General Assembly

November 11-12, 2010, Lima, Peru

URL: <http://www.sirgas.org>

AGU Fall Meeting

December 13-17, 2010, San Francisco, USA

URL: <http://www.agu.org>

17th International Workshop on Laser Ranging

January 17-22, 2011, Concepción, Chile

URL: <http://www.iers.org/>

GEOProcessing 2011

February 23-28, 2011 - Gosier, Guadeloupe, France

The Third International Conference on Advanced Geographic Information Systems, Applications, and Services

URL: <http://www.iaria.org/conferences2011/GEOProcessing11.html>

EGU General Assembly 2011

April 3-8, 2011, Vienna, Austria

URL: <http://meetings.copernicus.org/>

JURSE 2011 - Joint Urban Remote Sensing Event (URBAN 2011 + URS 2011)

April 11-13, 2011, Munich, Germany

Contact: jurse2011@bv.tum.de

Third Conference on Earth Observation for Global Changes (EOGC2011)

April 13-15, 2011, Munich, Germany

URL: <http://www.pf.bv.tum.de/eogc2011/>

EUREF 2011 Symposium

May 25-28, 2011, Chisinau, Republic of Moldova

URL: <http://www.euref-iag.net/>

7th International Symposium on Mobile Mapping Technology

June 13-16, 2011, Krakow, Poland

The Symposium MMT' 2011 will be held on 13 – 16 June 2011, in the Sheraton hotel Cracow, Poland. We strongly invite and encourage all professionals, researchers and academics, business and industry partners, students to participate in this important event. Science Chair: Dorota Grejner-Brzezinska.

The MMT2011 web site is up and running: <http://www.mmtcracow2011.pl/>.

TransNav 2011

June 15-17, 2011, Gdynia, Poland

URL: <http://transnav.am.gdynia.pl/>

IGAG Sister Societies' General Assemblies

XXV IUGG General Assembly

June 27 – July 8, 2011, Melbourne, Australia

URL: <http://www.iugg2011.com/>

Reports

The XXIV FIG International Congress Sydney 2010

Facing the Challenges – Building the Capacity

FIG Commission 5 Report

Introduction

The XXIV FIG International Congress was convened in Sydney, Australia during 11-16 April, 2010. More than 2200 persons from 100 countries participated in this memorable event. This was the largest FIG gathering ever! There were over 800 presentations, 10 parallel technical sessions, numerous meetings, seminars, work shops and social events. An Exhibition supporting the technical symposium was also organised for the week with at least 100 major international and local Australian vendors.

Overall, the Congress was well-organised at the Sydney Conference Centre which had the beautiful Darling Harbour as a background setting. From a Commission 5 perspective, the general feeling after the Congress was that this was another great occasion to 'catch up' with colleagues and to discuss the state-of-the-art concepts and workings pertaining to international geodesy and work within FIG.

The Technical Programme

For Commission 5 the primary purpose of FIG events is to provide operational surveyors the opportunity to present and interact with scientists, academics and public and private organisations on many different and

contemporary survey related topics. To achieve this FIG Commission 5 facilitated over 30 technical and flash sessions, and numerous discussion forums that were relating to “Positioning and Measurement” during the Congress! Over 150 presentations/papers were delivered in Commission 5 only and joint sessions with Commission 4 and 6. In most Commission 5 sessions there was ‘standing’ room only which meant on many occasions there were 100 plus delegates in attendance. With respect to papers and presentations the quality was good and there were only a few presenters who were ‘no shows’. To review the entire Commission 5’s technical program and to view papers/presentations refer to the FIG Congress website or web location – <http://www.fig.net/pub/fig2010/index.htm>

To summarise, Commission 5 have prepared and compiled the following comments from technical session Chairs and Rapporteurs to highlight the Congress proceedings –

- At various technical sessions, it was clear that other FIG Commissions consider our work as the very important geospatial infrastructure to underpin their activities that is the provision of ‘common’ reference systems as well as effective positioning services.
- Even though there appeared to be a limited number of new ideas or results from the various technical sessions at this Congress, the outcome was very good as it gave a good summary on the hot topics within geodesy at the moment.
- It was clear that many questions and issues raised are ‘universal’, that is the same questions and issues are discussed in many countries. The solutions are of course slightly different but in general they seemed to be in agreement on which direction national or regional geodesy should move.
- Paper 4526 – Simon Kwok, What Makes the Positioning Infrastructure Work – The Experience of the Hong Kong Satellite Positioning Reference Station Network provided a good overview of a unified positioning infrastructure in a small but ‘influential’ region.
- Paper 4554 - James Millner, Martin Hale, Jacqueline LeLievre, Hayden Asmussen and John Gallagher, Positioning Infrastructure Used for a Sustainable Future: Case Study from Victoria Australia. This paper provided a good overview of the use and value of the GNSS CORS in the state of Victoria with good examples in the agricultural and mining areas.
- The discussion on static, semi-dynamic or dynamic reference systems was interesting and due to plate tectonics the solutions varied in different countries. This topic will provide challenges for Commission 5 to consider as many countries are considering future options for and adoption of semi-dynamic or dynamic datums such as has been implemented in New Zealand.
- Numerous overview and status reports of GNSS CORS networks, their related services and technical issues were presented in several sessions – namely TS 3C, 4C, and 8F, FS 1H and 2H. It is always interesting to see the development in different countries and the different business model solutions for applications connected to GNSS CORS, from a commercial or private perspective, and the operations managed by the national mapping agencies.
- Numerous presentations discussed new GPS applications, however only a few discussed the future and the impact when other GNSS such as Glonass, Compass, and Galileo become fully operational or are overhauled.
- The development of accurate ‘cm’ geoid models and the move towards the adoption of national vertical datums based on these accurate geoid models were presented and discussed at numerous sessions (TS 1C, FS 1C, and TS 10I). In particular, the initiatives being undertaken by the US to gather new airborne gravity data for the development of their new ‘cm’ geoid model and possible implementation of this for a new vertical datum for North America.
- There was significant discussion around the development and current status of Asia Pacific Reference Frame (APREF) project in several sessions. These sessions, namely TS 6C and 7C, also provided a number of good papers and interaction amongst delegates around the development of the Global Geodetic Observing System (GGOS). This project and the development of a global ‘mm’ accurate reference frame will provide an important platform for studying global change such as rising sea level, climate change and the deforming earth.
- There were a number of interesting sessions related to measurement quality and standards. To highlight a few papers the reviewers have recommended reading the following:
 - Paper 4438 - Darren Burns and Rob Sarib, Standards and Practices for GNSS CORS Infrastructure, Networks, Techniques and Applications that gave solid practical advice on the establishment of GNSS CORS infrastructure.
 - Paper 3772 - William Henning, Real Time Network Guidelines from NOAA's National Geodetic Survey, gave a nice overview of NGS guidelines.
 - Paper 4226 - Robert Odolinski, Swedish User Guidelines for Network-RTK, gave a very interesting overview of guidelines for Network-RTK in Sweden.

- Paper 4145 and 4151 - Simon Fuller, Eldar Rubinov, Phil Collier and Seager James, Integrated Quality Indicators and Stochastic Modelling for Real-Time Positioning: Overview and Implementation, and Implementation of Real-Time Quality Control Procedures for Network RTK GNSS Positioning. Presentation was an interesting and novel talk on QA for RTK as it used a straw to demonstrate the fixed and variable errors in GPS measurements!
- Paper 3873 - Jorma Jokela, Pasi Hakli, Rupert Kugler, Helmut Skorpil and Michael Matus, Calibration of the BEV Geodetic Baseline.
- Paper 3910 - David Martin, Instrument Calibration at the ESRF.
- Paper 4308 - Philipp Zeimetz and Heiner Kuhlmann, Validation of the Laboratory Calibration of Geodetic Antennas based on GPS Measurement. A presentation of the ongoing GNSS antennae calibration work.
- The session TS 2C - Low Cost GNSS and New Positioning Techniques was an outcome of two Commission 5 activities and was well introduced by Volker Schwieger. First Neil Weston provided an overview of the FIG publication No. 49 Cost Effective GNSS Positioning Techniques, which was written by both Neil and Volker (Paper 4685). In this session Joel van Cranenbroeck presented a paper on Advanced Development in RFID Technology to Provide Solutions for Structural Health Monitoring Operations that showed a remarkable technology for the future (Paper 4508). Another paper dealing with low-cost GNSS and recommended for reading in this session is Paper 4208 - Reha Metin Alkan: Development of a Low-cost Positioning System Using OEM GPS Receivers and Usability in Surveying Applications.
- Paper 3768 - Daniel Roman, Yan Wang, Jarir Saleh and Xiaopeng Li, Geodesy, Geoids, and Vertical Datums: A Perspective from the U.S. National Geodetic Survey. This paper demonstrated a high level of competency and represented the topic very well
- Paper 3912 - Munkhtsetseg Dalkhaa, Geodetic Network and Geoid Height Model of Mongolia. A simple concise presentation and paper that showed real progress in a developing country in the field of geodesy.
- It was apparent that many organisations and/or surveyors are utilising GNSS for more monitoring.
- Paper 3786 - John Hannah's presentation and paper titled, The Problems and Challenges in Using Tide Gauges to Monitor Long-term sea Level Change, was nominated as a highlight paper from the Vertical Reference Frame session TS10L.
- Another session that was an direct outcome of Commission 5 activity, in this case the cooperation with the German Aerospace Centre (DLR) with respect to the TanDEM-X satellite project was TS 8C - New GNSS Applications and Developments. Here different presentations regarding the Digital Elevation Model as an outcome of the project and the evaluation by kinematic GPS tracks are presented by different presenters. We recommend for reading:
 - Paper 4030 - Detlev Kosmann, Birgit Wessel and Volker Schwieger: Global Digital Elevation Model from the TanDEM-X and the Calibration/Validation with Worldwide Kinematic GPS-Tracks and
 - Paper 4045 - Juergen Schweitzer, Bimin Zheng, Volker Schwieger and Detlev Kosmann: Evaluation of the TanDEM-X Digital Elevation Model by PPP GPS - Analysis and Intermediate Results.

Another highlight for Commission 5 was Vice President Matt Higgins presenting a keynote on "The Role of Positioning Infrastructure in the Technological Future of our Profession" in Plenary Session 4 on Technological Futures. The presentation outlined the latest developments in Positioning Infrastructure and the significant economic and environmental benefits enabled by the infrastructure. The presentation then covered future technological trends and their expected impact, such as how the real-time nature of precise positioning will create a next wave of spatial enablement, the need to deal with increasingly demanding users and the changing relationship between Positioning Infrastructure and Spatial Data Infrastructure.

Co-operation Between FIG and IAG and PCGIAP

FIG Commission 5 has been working intensively with the International Association of Geodesy (IAG) over the last few years and at this Congress these liaisons continued. FIG and IAG representatives (Chris Rizos, Ruth Neilan, and Markus Rothacher) held several meetings to define the structure of workings and future projects for the coming years. The result of such discussions were to continue joint focus on GGOS, the regional reference frame project – APREF, and to re-invigorate FIG's role in the AFREF (African Reference Frame) project via the next FIG Working Week in Marrakech. Other joint projects with tangible outcomes that needed to be developed concerned joint publications and work shops or schools at symposiums on topics such as ubiquitous positioning and reference frames.

In relation to the APREF sessions in Sydney, the Permanent Committee for GIS Infrastructure Asia – Pacific (PCGIAP) Regional Geodesy Working Group once again assisted both FIG and IAG to organise invited speakers as well as presentations. From meetings with PCGIAP representative (Dr John Dawson) it was agreed that this relationship with FIG should also continue into the 2011-14 term.

Social functions

The Congress Steering and Organising Committee arranged several social functions that many Commission 5 delegates attended with pleasure. They included:

- Welcome Reception at the Sydney Town Hall - a great historical location for old and new FIG delegates to greet each other.
- Foundation Dinner – a delightful evening boat cruise in the famous Sydney Harbour with Captain Cook Cruises
- Gala Dinner – an elegant formal dinner at the Dockside Cockle Bay
- FIG Farewell Reception – at the Parkside Foyer of the Sydney Convention Centre.

For Commissions 4, 5 and 6 the highlight function was their combined gathering of the ‘technical’ Commissions. This very popular traditional event was held at the “The Dunkirk” and was attended by almost 130 FIG delegates and friends of Commissions 4, 5 and 6. The participants enjoyed nice food, beverages of course, a “Quiz” night that was easily won by Commission 5, and the great comradeship amongst the technical crew. Special thanks to the University of New South Wales, C R Kennedy / Leica Geosystems, Professor Chris Rizos and Dr Craig Roberts for their assistance to make this gathering another memorable one.

General Assembly

From a Commission 5 perspective the General Assembly highlights were –

- The proposal to develop a FIG members database
- Acknowledgement of Commission 5 Publication No. 49 Cost Effective GNSS Positioning Techniques.
- Endorsement of the new Working Group on “Ubiquitous Positioning Technologies and Techniques” under Commission 5 (joint with Commission 6) that will be a collaborative working group with IAG. This working group will continue its work in 2011-2014. Allison Kealy, FIG (Australia) and Günther Retscher, IAG (Austria) have been appointed as co-chairs.
- Recognition of the FIG participation and work with the International Committee on Global Navigation Satellite Systems (ICG)
- The selection of Kuala Lumpur, Malaysia for the FIG Congress 2014.
- The election of -
 - Mr. Teo CheeHai from Malaysia as the FIG President for 2011- 2014
 - Dr. Chryssy Potsiou from Greece for the first position of Vice President for 2011- 2014
 - Prof. Rudolf Staiger from Germany for the second open position of Vice President for 2011- 2014.
 - Prof. Dalal S. Alnaggar was then appointed for Vice President for a two year period 2011- 2014.

Commission 5 Administration

Rudolf Staiger, Mikael Lilje, David Martin (Standards Network) and Rob Sarib attended ACCO. The Commission 5 Steering Committee held its last ‘face to face meetings’ and ‘Open Commission’ meeting for the term 2007-10. Minutes, detailing the meeting discussions from Sydney, (and previous meeting minutes of the current and past term) can be viewed at web location -

http://www.fig.net/commission5/steering_committee/steeringcommittee.htm. In summary, there was constructive discussion about the future workings of Commission 5 in the next term 2011-14, however the Steering Committee also reflected on what could have been done better and/or needed improvement. Overall the Steering Committee believed they had accomplished most of the objectives as outlined in the work plan.

Concluding Comments from Chair Rudolf Staiger

On behalf of the Commission 5 Steering Committee I wish to thank all who participated, contributed and attended the technical sessions and symposium to make this another successful Congress for Commission 5. I also take this opportunity to express my sincere gratitude to my hard working team for their professional contribution, and more importantly their friendship that they have displayed over the last 4 years. Their

dedication to FIG and the Commission 5 has been exemplary and I wish Mikael Lilje all the best for the term 2011-14.

Picture Gallery from FIG 2010



“The Stig” and Commission 5

Refer to the following website location for the Commission 5 Sydney Congress Picture Gallery - <http://www.fig.net/commission5/gallery/index.htm>

Important Future FIG Commission 5 Events

- 2010: IGS workshop, Newcastle, England
- 2010: IWAA, DESY Hamburg Germany
- 2011: FIG Working Week, Marrakesh, Morocco.
- 2011: Mobile Mapping Symposium, Krakow, Poland
- 2011: CLGE-seminar; European Reference System, Umeå, Sverige
- 2011: IUGG, Melbourne, Australia
- 2011: Deformation Measurement Symposium
- 2012: Machine Control and Guidance, Stuttgart, Germany
- 2012: FIG Working Week, Rome, Italy
- 2013: FIG Working Week, Abudja, Nigeria
- 2014: FIG Congress, Kuala Lumpur, Malaysia

ROBERT SARIB
LILJE MIKAEL
RUDOLF STAIGER

XXth EUREF Symposium in Gävle, June 2 – 5, 2010

At invitation of the Lantmäteriet - the Swedish mapping, cadastral and land registration authority - and co-sponsored by KTH Royal Institute of Technology and Onsala Space Observatory at Chalmers University of Technology, the IAG Reference Frame Sub-commission for Europe (EUREF) held its 20th Symposium from

June 02-05, 2010 in Gävle/Sweden. The EUREF Technical Working Group (TWG) met as usual the day before the beginning of the symposium, i.e. on June 01.

The symposium took place in the at the Clarion Hotel Winn Conference venue in Gävle. About 130 geodesists representing 29 countries met for this 2010 annual EUREF symposium.

The symposium was opened by St. Jönsson, Director General of Lantmätareiet and M. Lilje, Head of the Geodetic Department at Lantmätareiet. On behalf of the IAG, Z. Altamimi, President IAG Commission 1 "Reference Frames" and J. Torres, President IAG sub-commission 1.3 "Regional Reference Frames" as well as J. Ihde, Chairman of the EUREF Sub-commission expressed their good wishes for a successful conference.

EUREF is the Reference Frame Sub-commission for Europe of the IAG (International Association of Geodesy), a component of the Regional Reference Frames Sub-commission, integrated in Commission 1-Reference Frames. The long-term objective of EUREF, as defined in its Terms of Reference, "is the definition, realization and maintenance of the European Reference Systems, in close cooperation with the pertinent IAG components (Services, Commissions, and Inter-Commission projects) as well as EuroGeographics".

The results and recommendations proceeding from EUREF support the use of the European Reference Systems in all scientific and practical activities related to precise geo-referencing and navigation, Earth sciences research and multi-disciplinary applications. EUREF makes use of the most accurate and reliable terrestrial and space-borne techniques available, and develops the necessary scientific background and methodology.

Its activities are focussed on a continuous innovation and on the changing user needs, as well as on the maintenance of an active network of people and organizations, and may be summarized as follows:

- to maintain the ETRS89 (European Terrestrial Reference System) and the EVRS (European Vertical Reference System) and upgrade the respective realizations;
- to refine the EUREF Permanent Network (EPN) in close cooperation with the IGS (International GNSS Service);
- to improve the Unified European Levelling Network (UELN);
- to contribute to the IAG Project GGOS (Global Geodetic Observing System) using the installed infrastructures managed by the EUREF members.

These activities are reported and discussed at the EUREF Symposia, an event that occurs every year since 1990, with an attendance of numerous participants coming from nearly all countries in Europe and other continents, representing universities, research centres and the NMCA (National Mapping and Cadastre Agencies). It's an open forum, and may be attended by any person interested in the work of the Sub-Commission.

The organization of the EUREF Symposia has been and will be supported by EuroGeographics, the consortium of the European NMCA, reflecting the importance of the EUREF work for practical purposes. This involvement is consolidated by a formal liaison between EUREF and EuroGeographics.

The scientific programme covered the following topics:

- Activities of the TWG
- New Developments in GNSS Networks
- Modelling the Earth with GNSS
- Mitigation of GNSS Error Sources
- Height, Gravity, Geoid, and Combination of Techniques
- Improvements and Densifications of the ETRS89
- National Reports

In about 41 oral presentations and 29 National Reports as well as 20 posters various aspects of EUREF and neighbouring topics were treated. The available texts will be published as usual in the EUREF Proceedings withing the publications series of the German Bundesamt für Kartographie und Geodäsie (BKG). By courtesy of our colleague Carl Calvert, UK, a "Best Student Poster Award" was handed over again to a young scientist. This award was give to Olga Bjelotomic, University of Zagreb, Zagreb/Croatia, for the submission of a poster by her together with D. Markovinivic and T. Basic, entitled 'Detection of the Multipath Effect in the ING2 GPS station with a new developed software'.

The scientific sessions were accompanied by a social programme with impressive arrangements of Swedish hospitality and culture.

A detailed overview on this symposium (programme, participants, ppt-files of presentations, photo gallery etc.) can be found in the EUREF homepage – see symposia. There also the previous symposia are documented.

The EUREF Sub-commission acknowledges the financial support given by EuroGeographics for the enabling the participation of delegates from economical weak countries.

By courtesy of the colleagues of the Republic of Moldova, the EUREF Sub-commission is invited to hold its 2011 Symposium in Chisinau, Republic of Moldova from May 25-28, 2011. Details will be published in the EUREF homepage in time.

Resolutions of the XXth EUREF Symposium in Gävle, June 2 – 5, 2010

Resolution no. 1

The IAG Reference Frame Sub-commission for Europe (EUREF)

Recognising that GNSS campaigns and subsequent computations were completed and presented to the Technical Working Group (TWG) as

1. EUREF Czech 2009;
2. EUREF EIR/UK 2009; and
3. EUREF GR 2007;

by representatives of the Observing Nations and these results were accepted as Class B standard by the TWG

Endorses the set of points for 1) Czech Republic, 2) Republic of Ireland and the UK and 3) Greece, as submitted to the TWG as an improvement and extension of ETRS89.

Resolution no. 2

The IAG Reference Frame Sub-commission for Europe (EUREF)

Considering the TWG recommendation of adopting the ETRF2000 as a conventional terrestrial reference frame of the realisation of ETRS89

Noting the great benefit of harmonising the ETRS89 realisations at the national level of the European countries and consequently minimizing possible discrepancies in geo-referencing applications through Europe

Recommends that the NMCAs adopt the ETRF2000 as the basis for future national implementations of ETRS89

Resolution no. 3

The IAG Reference Frame Sub-commission for Europe (EUREF)

Noting the leading role that EUREF has taken using and developing the use of GNSS together with the advantages that such leadership has given Science, IAG, EU and NMCAs;

Recognising the GNSS modernisation programmes in particular the European Galileo;

Encourages members of EUREF to provide the necessary infrastructure, data and analysis from these new GNSS developments:

Requests the TWG to establish a platform for the exchange of experiences in upgrading the EPN.

Resolution no. 4

The IAG Reference Frame Sub-commission for Europe (EUREF)

Noting that the European contribution to the IAG WG on Regional Dense Velocity Fields is coordinated by EUREF

Considering that there are permanent tracking stations, not included in the EPN, but are of scientific importance

Encourages analysis of the data following the guidelines for EUREF densifications and transmission of weekly SINEX solutions to EUREF

Resolution no. 5

The IAG Reference Frame Sub-commission for Europe (EUREF) which held its twentieth symposium in Gävle from June 2 – 5, 2010

Expresses its sincere thanks to the Lantmäteriet and the Local Organising Committee Mikael Lilje, Lars E Engberg, Christina Kempe, Martin Lidberg, Bo Jonsson, Peter Wiklund, Jan Johansson (Chalmers) and Lars Sjöberg (KTH) for organising the symposium and for the excellent arrangements resulting in a very successful meeting and for the support given by the sponsors Future Position X, Leica Geosystems and SP Technical Research Institute of Sweden AB.

JOHANNES IHDE
EUREF Chair

HELMUT HORNIK
EUREF Secretary

Fast Bibliography

The fast bibliography consists of a listing of papers relevant to Geodesy that has been collected by the IAG Bibliographic Service (IBS) since previous issue of the fast bibliography (IAG Newsletter February 2010). The IBS is based on the literature data base GEOPHOKA, which is maintained by BKG (Bundesamt für Kartographie und Geodäsie) at the Branch Office Leipzig, Karl-Rothe Strasse 10-14, 04105 Leipzig, Germany. The IBS can be reached at the following Internet address: <http://www.bkg.bund.de> or furthermore through the homepage of IAG: <http://www.iag-aig.org>.

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