



International Fédération of Surveyors
Fédération Internationale des Géomètres
Internationale Vereinigung der Vermessungsingenieure

FIG Commission 5 Positioning and Measurement June 2015 e Newsletter and FIG Working Week Sofia Report

Dear Colleague,



In this edition you will read about the activities of our Commission at the FIG Working Week and 38th General Assembly in Sofia, Bulgaria. The Working Plan for the period 2015-18 is also briefly introduced.

First of all I will briefly introduce myself. My name is Volker Schwieger and I am the new FIG Commission 5 Chair for the period 2015 to 2018. I am working as head of the Institute of Engineering Geodesy at the University of Stuttgart. Together with the current, and partly new team, I will give my best to continue the successful Commission 5 work. I give my special thanks to Mikael Lilje, the previous Commission Chair, and to Rob Sarib, the 12-year Vice Chair of Administration, both having done an excellent job and being real friends.

My personal FIG career started in 2006 where I began as a Chair of Working Group 5.4 "GNSS"; from 2010 to 2014 I was heading the Working Group 5.4 "Kinematic Measurements" and since 2015 I am the Chair of Commission 5.

Working Plan and Our Team 2015-2018

Obviously, a Chair is nothing without his team. In the following, the current Commission 5 team as well as the respective Working Group responsibilities are presented:

Vice Chair of Administration: Ms. Li Zhang (Germany)

Working Group 5.1 – Standards, Quality Assurance and Calibration: Dr. David Martin (France)

Working Group 5.2 – 3D Reference Frames: Mr. Nic Donnelly (New Zealand)

Working Group 5.3 – Vertical Reference Frames: Mr. Kevin M. Kelly (USA), Dr. Dan Roman (USA)

Working Group 5.4 – GNSS: Dr. Neil Weston (USA), Dr. Suelynn Choy (Australia)

Working Group 5.5 – Multi-Sensor-Systems: Dr. Allison Kealy (Australia), Dr. Günther Retscher (Austria)

Working Group 5.6 – Cost Effective Positioning: Dr. Leonid A. Lipatnikov (Russia)

The structure and definition of the Working Groups already give a good idea about the topics we will deal with in the future. For more detailed information, please refer to the complete Working Plan (<http://www.fig.net/organisation/comm/5/workplan.asp>). We are still waiting for new members for the working groups, so please do not hesitate to contact the responsible Working Group Chairs if you are interested. Please feel also free to distribute this newsletter to colleagues and friends.

Commission Chair: Volker Schwieger

WG 5.6 Chair: Leonid A. Lipatnikov

Vice Chair of Administration: Li Zhang

WG 5.5 Chair: Allison Kealy

WG 5.1 Chair: David Martin

WG 5.4 Co-Chair: Suelynn Choy

WG 5.2 Chair: Nic Donnelly

**FIG Commission 5
2015-2018**

WG 5.4 Chair: Neil Weston

WG 5.3 Chair: Kevin M. Kelly

WG 5.3 co-Chair: Dan Roman

Kind regards

Volker Schwieger, (Volker.Schwieger@ingeo.uni-stuttgart.de)
Chair of FIG Commission 5

FIG Working Week – Sofia, Bulgaria, 17-21 May 2015



The Event Overview



The FIG Working week and 38th General Assembly was held 17th-21st May, 2015 in Sofia, Bulgaria. The event was jointly organized by FIG and the Chamber of Graduated Surveyors of Bulgaria. About 900 surveyors from 68 different countries participated in this working week, more than 200 participants came from Nigeria, the most numerous country group. There are about 320 presentations in 3 plenary sessions and 67 technical sessions. Besides there were 6 Joint UN-Habitat GLTN & FIG sessions and 4 Joint UN-Habitat & FIG workshops.

Technical Program Summary

Commission 5 had 11 technical sessions and 3 of them were joint with Commission 6. The chairs and rapporteurs of each session have provided the summary and highlights.



TS01G - Special session on Atmospheric Application of GNSS

This special session was dedicated to the hot topic of atmospheric applications of GNSS e.g. in the field of weather forecast and climate change. An audience of more than 60 delegates was listening to six scientific-oriented talks covering the whole domain addressed by this session. GNSS reflectometry as well as different tropospheric products for different regions of the world were presented. The excellent report of Suelynn Choy et al. on atmospheric sounding in the Australian region and the numerous and valuable contributions of Guergana Guerova showing the high involvement of the hosts in this topic should be spotlighted within the session. The relevance of the session was underpinned by the publication of the forecast topic that rapidly got numerous followers.

TS02G - Datum Definition

Five excellent terrestrial reference frame related papers were presented in this session by authors from New Zealand, Russia, Indonesia and USA. The common theme in this session had to do with the implementation, now and in future, of four-dimensional dynamic geodetic reference frames (datums) in the countries represented. Interestingly, while Indonesia has implemented a semi-dynamic reference frame, New Zealand continues to look for better solutions to define a dynamic datum for its country. The USA is planning to adopt a new three-dimensional geometric reference frame along with a geoid-based vertical reference frame by the year 2022. The potential unfavorable impact of neglecting the dynamic nature of positions of features on Earth's surface was clearly demonstrated with examples from New Zealand. Russia is rigorously tackling the thorny issue of coordinate transformations between geocentric reference frames and classical geodetic datums – a problem all countries supplanting existing geodetic datums with three-dimensional reference frames will have to address sooner or later. Not only did the subjects presented dovetail well, they also provided useful insights about why many countries need to adopt four-dimensional reference frames, and the non-trivial effort needed to relate data on classical datums to the new geocentric ones.

TS03G - Geoid Determination

Six papers were presented during this session, which explored local geoid models and gravity networks with applications towards vertical datum control. Victor Nnam demonstrated how GPS and levelling control data were used to determine a local geoid in Nigeria. Slaveyko Godspodinov and Elena Peneva presented separate papers that covered practical aspects of the gravity network in neighboring Macedonia (FYROM). Arihensa Pahvlevi covered the development of geoid modeling in Indonesia, while Ronald Ssengendo and Ulku Kirici covered models for Uganda and Turkey, respectively. The session was well attended by numbers progressively increasing from 25 to 50 from the first to the last paper. Many substantive questions were raised and answered and contacts were made for future collaborations.

TS04G - GNSS PPP

All four papers were presented during the PPP session with about 40 audiences. Joseph Odumosu presented an interesting research on the analysis of the spatio-temporal variation and the impact of tropospheric delay based on PPP

Observation using the RTKlib in Nigeria. And there were some papers about a practice test of PPP compared with the RTK or implementation of Software for web-based PPP applications for automated data processing. At the end, the presentation given by Eugene McGovern about the assessment of accuracy of PPP using the different online-PPP services in Osman, initialized a heated discussion. In the session, there was a combination of academic and practical papers. PPP is the trend of the GNSS Positioning and should be one of the main important trends in the next working week.



TS05G - Multi-GNSS and GNSS specialties

This session was very lively. The topics and presentations spurred a lot of good discussion amongst the presenters and the audience. More papers/presentations should be encouraged on this topic on multi-GNSS in the coming working weeks. Online GNSS processing software is also a popular topic.

TS06G - Reference Frames & CORS

The presentations covered diverse parts of the globe, providing insight into reference frame activities in Saudi Arabia, Japan and France. Saudi Arabia is in the midst of a substantial investment in geodetic infrastructure to support both horizontal and vertical positioning. The Japanese presenters discussed their move away from supporting passive control marks in favour of active control via CORS, and the use of semi-dynamic corrections to account for Japan's ongoing deformation. The French presentation focussed particularly on the vertical component, and how precise levelling is used to provide high precision relative heighting in urban areas, in combination with GNSS heighting and a geoid model to provide connection to the national vertical reference frame. There was good interest from the audience, with questions/comments about topics such as airborne gravity and the incorporation of deformation models into software.

TS07E - TLS (Joint Commission 5 and 6 Session)

Here mainly different application of the nowadays established technique of terrestrial laser scanning (TLS) were presented by different colleagues around the world. The range was from aircraft and steel construction quality control to measurement of biomass parameters as well as deformation monitoring. Schmitt et al. presented a remarkable approach of using B-splines for modelling curves for monitoring applications. A very good contribution was presented by Lichti et al. concerning the recent problem of calibration of laser scanners. They proposed a developed procedure that can be applied automatically.

TS08E - GNSS for Monitoring (Joint Commission 5 and 6 Session)

This session was a joint commission 5 and 6 session about the GNSS technologies for the Monitoring. Monitoring is one of the most important high-precision applications of GNSS and also offers the widest field for research and development. The four presented papers covered diverse aspects of this theme.

The presentation given by Anna B.O. Jensen about the exciting projection “Fehmarnbelt Fixed Link”, which is a tunnel between Germany and Denmark was one highlight. There are many challenges in such a big project between two countries, e.g. height systems. Permanent GNSS stations are set up, different measurement methods like GNSS, precise motorized levelling are applied. The definition of reference frames and map projections are introduced, it was a very good presentation. Furthermore, Joel van Cranenbroeck presented the first practical results of Beidou. GNSS RTK in Belgium was introduced, a maximum of six Beidou satellites can be received in Belgium. In the near future (up to 2020), more Beidou satellites can be received worldwide. More Beidou satellites will improve availability, reliability and the accuracy of the GNSS Positioning significantly. The Multi-GNSS is one of the trends of the GNSS positioning. In the session, there was a combination of academic and practical papers. State-of-the-art experience in establishing monitoring GNSS infrastructure for monitoring and other engineering tasks, results of the latest evaluation of multi-GNSS performance, development and testing of algorithms were discussed at the session in a lively and relevant manner.

TS08G - Geo-Dynamics and GNSS Analysis

There were only three presentations (out of six) and they covered quite different topics: Robustness analysis of GPS network in Oran City, Algeria; Sofia University GNSS Analysis Center, looking at computation of tropospheric zenith path delay and integrated water vapour and Slip rate estimate of Western North Anatolian Fault system in Turkey.

Unfortunately, there were not so many discussions/questions from the audience. It may be due to the session schedule - the last session of the conference. Or alternatively, the topic may not be of interest to the general audience.

Task Force on Commission Structure

The FIG Council received in 2014 a suggestion from Suisse about the process on finding commission chairs and in 2015 from several Nordic member associations on reviewing the current commission structure. The Council suggested the General Assembly to approve the setup of a Task Force, and Mikael Lilje was asked to chair it. The task force will continue as long as it is necessary but end at the latest at the Congress in 2018. During the FWW in Sofia, the TF had several meetings as well as an open meeting scheduled in the technical program. The TF is now focusing on presenting a first proposal at FWW in 2016.

Task Force on Scientific Journals

During the General Assembly a task force on Scientific Journals was created that should consider the possibilities to FIG Working Week or Congress Papers in well-established journals or create a new FIG journal for this purpose. The main aim is to attract more academics for the FIG events and to raise the quality of the

papers. The Chair of Commission 5, Volker Schwieger, participates in this Task Force which deals with important issues. In Sofia, a first meeting took place and the different before-mentioned possibilities were extensively discussed.

Besides, there are sessions of UAV and Photogrammetry as well as In-Door Positioning. For more information about all the technical sessions, please refer to website -

http://www.fig.net/resources/proceedings/fig_proceedings/fig2015/techprog.htm to review the all the presentations and technical papers as well as the reports of the task forces.

Meetings

One of the primary purposes of FIG conferences is to provide working group members the opportunity to meet, resolve and formulate strategies 'face to face', both formally and informally. Commission 5 is very supportive of such meetings and convened various administrative meetings during this event. The main meetings that the Commission 5 Chair and Vice Chairs attended were:

Commission 5 Open Meeting

The **Open Meeting** was well-attended with about 50 participants. Commission Chair Volker Schwieger generally introduced the FIG and Commission 5 at the beginning. The Working Group chairs then introduced their working groups, the content and working plan 2015-2018. This initialized a heated discussion in the audiences. The audiences show great interest on participating in the commission. Commission 5 is continually developing the membership for their working groups, the contributions and the membership of WG are strongly welcome. The contacts will be collected, the participants can write down their interested WG and send it to the WG chairs.



Commission 5 Steering Committee Meeting

Two steering Committee Meetings were held. The first one was prior to the technical program, in order to do the last preparations for the technical programs and open meeting. Volker Schwieger reported about the ACCO meeting. The upcoming "Technical Seminar on Vertical Reference Frames, which will be held in Singapore 27-28 July (in conjunction with SEASC 2015) was intensively discussed. The second steering Committee Meeting was, after all the technical program, with the purpose to collect the feedback of this working week. The Task Force on Scientific Journals was intensively discussed.

A summary of the discussions from the **steering committee meeting** can be found in respective Minutes, and are available via the web location –

https://www.fig.net/organisation/comm/5/steering_committee/2015_steering_meeting.pdf.

General Assembly

As per other Congresses or Working Weeks, the 38th FIG General Assemblies (GAs) was split on two days, before and after the technical program. The main outcomes or highlights from the GAs were –

- 4 Task Forces were established, for Commission 5 the Task Forces on Commission Structure and on Scientific Journals are of special importance.
- Regarding the hosting of FIG WW 2019, there was a very close neck-and-neck race between VGGR, Vietnam and Geosuisse Switzerland. In the second round VGGR, Vietnam was selected (40 vs. 35 votes). So the FIG WW 2019 will be held in Hanoi, Vietnam.
- A new Chair for Commission 9 “Valuation and the Management of Real Estate” Mr. Steven L. Nystrom (USA) was appointed, since Liao Junping resigned from the post.

Besides, honorary president, honorary member and honorary ambassador are appointed. Several affiliate members, corporate members and academic members are admitted as new members by General Assemblies. For more details about the General Assemblies, please refer to the FIG website. Web location – http://www.fig.net/news/news_2015/2015_05_ga-report.asp.

Social Activities

There were several social events organized for the delegates –

Opening Ceremony

The opening Ceremony was in the same room as the 38th General Assembly, in the National Palace of Culture in Sofia in Hall 3.



Foundation Dinner

The foundation Dinner was a Bulgarian style dinner in Vodenitsata Restaurant.



Gala Dinner

The Gala Dinner was held at the Kempinski Hotel Ballroom, entertained with music and dance.



Commission 4, 5, 6 Dinner

The traditional Commission 4, 5, 6 Dinner was held at the restaurant called "Manastirska Magernitsa". It was a perfect occasion to get to know many experts and share knowledge and discuss with them in a very pleasant atmosphere. The traditional Bulgarian food, wine and beer were excellent.



For more photos of the Congress, please refer to the FIG Picture Galleries at the FIG Congress website. Web location – http://www.fig.net/fig2015/photo_gallery.htm.

Upcoming events

Technical Seminar on Vertical Reference Frame, 27-28 July 2015, Singapore

This seminar is organized by FIG Commission 5. For more information, please refer to: https://www.fig.net/events/2015/com5_vertical_ref_frames.pdf.

The number of participants will be restricted to 50.

Registration is now open via FIG

web: <https://www.fig.net/registrations/regform.asp?eventid=128>

Intergeo 2015, Stuttgart, Germany, organised by DVW

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

9th International Symposium on Mobile Mapping Technology, 9-11 December 2015, Sydney, Australia

Web: www.mmt2015.org

2016 IGS workshop, 16-19 February 2016, Sydney, Australia

Web: <http://kb.igs.org/hc/en-us/articles/205944657-2016-IGS-Workshop-Information>

3rd Joint International Symposium on Deformation Measurements, JISDM, 30 March - 1 April, 2016, Vienna, Austria

Web: <http://www.jisd2016.org/>

Interexpo GEO-Siberia, 20-22 April 2016, Novosibirsk, Russia

FIG Working Week, 2-6 May, 2016, Christchurch, New Zealand

Web: <http://www.fig.net/fig2016/>



FIG Working Week, 29 May- 2 June, 2017, Helsinki, Finland

Web: <http://www.fig.net/>

FIG XXVI Congress, 6-11 May, 2018, Istanbul, Turkey

Web: <http://www.fig.net>

FIG Working Week, 2019, Hanoi, Vietnam

Web: <http://www.fig.net>

How to Participate in Our Commission

Commission 5 Chairs of the working groups are continually developing the membership for their working groups. There is still opportunity for you to join any of the working or joint working groups.

People interested in being involved in one of the working groups should contact the Chair of the relevant Working Group and send a copy to Vice Chair of Administration – Li Zhang li.zhang@ingeo.uni-stuttgart.de.

All responses should include a one or two paragraph biography of your professional career to date.

There is also another way to assist Commission 5 with their work and that is to become a National Delegate to Commission 5. Please note, we recommend that before you consider this option you will need to check with your FIG member association whether they already have a National Delegate for Commission 5 and if it has been officially listed on our website, location <http://www.fig.net/organisation/comm/5/delegates/index.asp>.

Briefly, the role of a National Commission Delegate is to -

- establish networks within their countries to communicate information and obtain feedback for the Commission,
- be actively involved in commission activities, including responding to questionnaires or correspondence and identifying topics and authors of papers for Commission symposia and FIG congresses,
- seek and encourage funding support to attend FIG activities, including commission meetings, and
- write at least one annual report for publication in a local newsletter or technical journal or for dissemination by some other means to individual members of their member association or organisation.

If you wish to be a National Delegate for Commission 5 your FIG member association must formally submit in writing to the FIG Office the name, professional title, address, telephone and fax numbers and email address of the nominated person.

Commission 5 looks forward to your response and please do not hesitate to ask any questions or contact us if you have any further queries.

FIG Commission 5 e-Newsletter

If you would like to circulate Commission 5 NEWS to all our members please email your item for consideration to the

- Vice Chair of Administration – Li Zhang li.zhang@ingeo.uni-stuttgart.de or
- Chair of Commission 5 - Volker Schwieger volker.schwieger@ingeo.uni-stuttgart.de

More Information can be found in

Web: <http://www.fig.net/organisation/comm/5/> (**New Website**)