IAG/FIG Commission 5/ICG Technical Seminar
Reference Frame in Practice
Rome, Italy 4–5 May 2012

International Committee on Global Navigation Satellite Systems (ICG) and its Programme on Global Navigation Satellite Systems (GNSS) Applications

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International Committee on Global Navigation Satellite Systems (ICG)

a forum to discuss Global Navigation Satellite Systems to benefit people around the world

- **2005: Establishment of ICG**
  - **ICG Membership: Members, Associate Members and Observers**
    - **9 nations & the European Union**
    - **20 organizations (UN system entities, IGOs, NGOs) – IAG&FIG: founding members**

ICG participation is open to all countries and entities that are either GNSS providers or users of GNSS services, and are interested and willing to actively engage in ICG activities

International Committee on Global Navigation Satellite Systems (ICG)

2006 – 2012: ICG Annual Meetings

- **UNOOSA (2006), India (2007), USA (2008), Russia (2009), Italy & EU (2010), Japan (2011)**

2007: Establishment of Providers' Forum

- **China (Compass/BeiDou), India (GAGAN/IRNSS), Japan (QZSS/MSAS), Russia (GLONASS), US (GPS), EU (Galileo/EGNOS)**

2012: ICG-7, Beijing, China, 5 – 9 November

2013: ICG-8, Dubai, United Arab Emirates

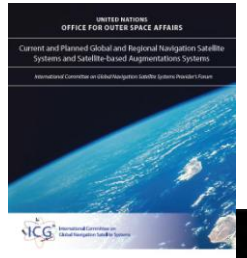
International Committee on Global Navigation Satellite Systems (ICG)

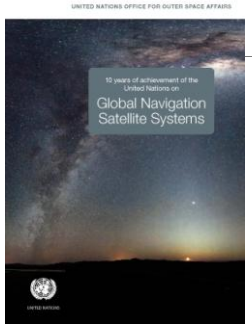
ICG Working Groups

- ***Compatibility and Interoperability (USA and Russia)***
- ***Enhancement of performance of GNSS services (India and ESA)***
- ***Information dissemination and capacity building (UNOOSA)***
- ***Reference Frame, Timing and Applications (IAG, IGS, FIG)***

ICG Executive Secretariat: UNOOSA

ICG website: www.icgsecretariat.org





Achievements of providers and users of positioning, navigation, and timing services, under the umbrella of the United Nations, in promoting GNSS over the past 10 years

International Committee on Global Navigation Satellite Systems (ICG)

WG-A: Compatibility & Interoperability

- **Continuation of WG-A Compatibility subgroup**
- **Proposed workshop on GNSS Spectrum Protection and Interference Detection and Mitigation**
- **Consensus on Open Service GNSS performance parameters, including definitions and calculation methods**
- **International GNSS Monitoring and Assessment**

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WG-B: Enhancement of the Performance on GNSS Services

- **Integrity via ARAIM**
- **Satellite Navigation in Natural Disasters**
- **Workshop on New Message Broadcasts in New Signals**
- **Establishment of a subgroup on "GNSS Applications"**
- **Interoperable GNSS Space Service Volume**
- **Standardization for Maritime Applications**

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WG-C: Information Dissemination and Capacity Building

- **Education and Training programmes on GNSS**
- **Promoting the use of GNSS technologies as tools for scientific applications**
- **Observation of space weather phenomena through the deployment of ground-based instrument arrays such as GPS receivers, magnetometers, solar telescopes, very low frequency (VLF) monitors, solar particle detectors, and data analysis and the sharing of recorded data**
- **Regional workshops on applications of GNSS**

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WG-D: Reference Frames, Timing and Applications

- **Finalization and publication of Templates on Geodetic and Timing References**
- **Interoperability of geodetic references among the different GNSS systems**
- **International GNSS Service Multi-GNSS Global Experiment – IGS M-GEX, as follow up to the Multi-GNSS demonstration campaign in Asia and Oceania**

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Multi-GNSS Demonstration Campaign/Project

- **To be conducted in order to encourage and promote the introduction and utilization of satellite positioning, navigation and timing services in the Asia and Oceania region through assistance with the integration of GNSS services into national infrastructures;**

Asia/Oceania region is a unique place where the number of usable modernized navigation satellites will increase much faster than in other areas of the world

Therefore, International Committee on Global Navigation Satellite Systems:

- ***Agreed* that the multi-GNSS demonstration campaign would be beneficial to ICG efforts focused on promotion of interoperability among multiple GNSS;**
- ***Endorsed* the implementation of the multi-GNSS demonstration campaign;**
- ***Encouraged* participation by all GNSS Providers and users in Asia/Oceania region to develop new applications and carry out experiments or demonstrations jointly.**

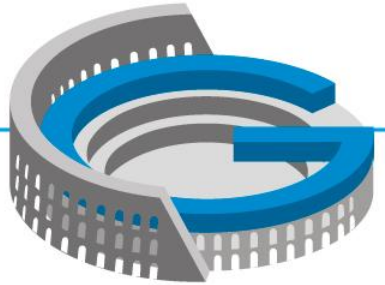
www.multignss.asia

Programme on GNSS Applications

International Space Weather Initiative: *http://www.iswi-secretariat.org/*

A programme of international cooperation to advance the space weather science by a combination of instrument deployment, analysis and interpretation of space weather data from the deployed instruments in conjunction with space data, and communicate the results to the public and students

- ***2010: UN/Egypt Workshop, 6 – 10 November, Helwan University: Western Asia***
- ***2011: UN/Nigeria Workshop, 17 – 21 October, Abuja: Africa***
- ***2012: UN/Ecuador Workshop: 8 – 12 October, Latin America and the Caribbean***
  - ***International Centre for Space Weather Science and Education, Space Environment Research Centre (SERC), Kyushu University, Japan***
    http://www.serc.kyushu-u.ac.jp/index_e.html



Programme on GNSS Applications

Regional Workshops on the Applications of GNSS: ***increase awareness among decision and policy makers of the benefits of GNSS and develop regional and national pilot projects on GNSS applications***

- ***UN/Latvia Workshop on GNSS, 14 – 18 May 2012, Riga, Latvia***

- ***GNSS Education Curriculum:*** ***9-months postgraduate course (540 hours of theory & 540 hours of laboratory experiments, field visits, project works, and 1 year thesis).***
- ***The course is recommended, but not limited, to graduate in***
  - ***Electronics & Communications Engineering; Geomatics, Computer Software Engineering***
  - ***Regional Centres for space science and technology education, affiliated to the United Nations, also acting as the ICG Information Centres***
  - ***Indicative topics are arranged under the following topics: Fundamentals; Position Determination Techniques, Technologies (Augmented systems), Embedded System Design and Sensors, GNSS Receivers, GNSS/INS Integrated Navigation, GNSS Applications, Laboratory experiments, field visits, project work***

Programme on GNSS Applications

Training for capacity building in developing countries:

provide support to the regional centres for space science and technology education, affiliated to the United Nations, which also act as the ICG Information Centres

- ***Africa: Morocco and Nigeria***
- ***Latin America and the Caribbean: Brazil and Mexico***
- ***Asia and the Pacific: India***
- ***Western Asia: Jordan***

- ***Remote Sensing & GIS, Satellite Meteorology & Global Climate, Satellite Communications, Space & Atmospheric Science***
  - ***International Centre for Global Navigation Satellite Systems Science, Technology and Education, International School of Beihang University, Beijing, China - http://ev.buaa.edu.cn/***

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