International Association of Geodesy Newsletter

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Contents

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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Meeting Announcements

Workshop on Monitoring North American Geoid Change

Boulder, Colorado, USA, October 21-23, 2009
URL: http://www.ngs.noaa.gov/GRAV-D/2009Workshop/

Dear Colleagues,

We are pleased to announce that a *Workshop on Monitoring North American Geoid Change* is going to be held in Boulder, Colorado, USA from October 21 through 23, 2009.

The goal of this workshop is to develop a collaborative plan to use common standards to monitor the geoid model over North America, through a combination of dedicated absolute gravity campaigns and reliance on continued satellite gravity missions. This monitoring is critical to various governments in North America that have begun moving toward a geoid-based determination of their vertical datum.

Experts in absolute and satellite gravity and geoid determination are asked to attend. The few oral presentations will be limited to invited speakers, but an open poster session will be held. A tour of the Micro-G/LaCoste facilities and a tour of the Table Mountain Geophysical Observatory (TMGO) will be included.

- Registration for the workshop is free.
- Hotel and registration information are provided at the URL above.

We look forward to seeing you in Boulder!

DRU SMITH AND JOE HENTON

AGU-Fall Meeting 2009 Session G02 - GRACE, GOCE and Beyond

December 14-18, 2009, San Francisco, USA

The geodetic community is in a unique situation, with several dedicated gravity field missions in operation simultaneously. The status of the GOCE and GRACE missions will be provided. This session solicits papers that describe innovative new applications of data collected by these missions. Papers that describe science insights from new signals uncovered in the data, or new techniques of signal extraction are encouraged. Topics of interest also include simultaneous exploitation of GRACE and GOCE data; exploitation of 3d satellite gravity gradient data; combinations of satellite and in-situ data; methods of extending the mass-flux data records beyond the mission lifetimes; and potential directions to ensure the continuity of these measurements into the future.

This session is intended to be a lively forum for a discussion of application of mass flux measurements from these satellite missions; what they are telling us today; and how we might proceed in the future. The Scientific Program will be accessible from the webpage http://www.agu.org/meetings/fm09/program/index.php.

MARK DRINKWATER AND SRINIVAS BETTADPUR
Session Conveners

EUREF Symposium 2010

June 2-5, 2010, Gävle, Sweden

The next EUREF Symposium will be held in Gävle, Sweden, June 2-5, 2010. See also http://www.euref.eu/. The homepage will be updated soon and from time to time be completed.

HELMUT HORNIK

IAG Sponsored Meetings

2nd International Colloquium – Scientific and Fundamental Aspects of the Galileo Programme

October 14-16, 2009, Padua, Italy
The second international colloquium on fundamental aspects and scientific applications of Galileo and GNSS will be held in Padua October 2009. The colloquium will address three major areas of research. The fundamental aspects of navigation by satellites and Galileo. Scientific applications in meteorology, geodesy, geophysics, space physics, oceanography, land surface and ecosystem studies, using either direct or reflected signals, differential measurements, phase measurements, radio occultation measurements, using receivers placed on the ground, in airplanes or on satellites. Scientific developments in physics and dealing with future systems, particularly in testing fundamental laws, in astronomy, in quantum communication, and in developing clocks or experiments based on GNSS. To find more information, please visit the conference website http://www.congrex.nl/09c10/.

Workshop on Monitoring North American Geoid Change

October 21-23, 2009, Boulder, Colorado, USA
Workshop on Monitoring North American Geoid Change is going to be held in Boulder, Colorado, USA from October 21 through 23, 2009. The goal of this workshop is to develop a collaborative plan to use common standards to monitor the geoid model over North America, through a combination of dedicated absolute gravity campaigns and reliance on continued satellite gravity missions. This monitoring is critical to various governments in North America that have begun moving toward a geoid-based determination of their vertical datum. Please visit http://www.ngs.noaa.gov/GRAV-D/2009Workshop/ for details.

IAG Related Meetings

2nd Workshop on Absolute Long Distance Measurement in Air

October 2, 2009, VSL, Delft, The Netherlands
The Workshop is organized within the scope of the European Metrology Research Programme, Joint Research Project 3.1 on Long Distance measurement in air. The workshop aims to cover the current status in the field of long distance measurement in air, with contributions from both invited speakers and JRP partners. The Preliminary Programme for the 2nd Workshop is being prepared and will be posted at the official webpage of the project www.longdistanceproject.eu.

IERS Workshop on EOP Combination and Prediction

October 19-21, 2009, Warsaw, Poland
URL: http://www.cbk.waw.pl/EOPPW2009/

International UN-SPIDER Bonn Workshop

October 21 – 23, 2009, Bonn, Germany
The Third United Nations International UN-SPIDER Bonn Workshop: Disaster Management and Space Technology From Concepts to Applications is being jointly organized by the United Nations Office for Outer Space Affairs (UNOOSA) and the German Aerospace Center (DLR). The workshop will be held in Bonn, Germany, from 21 – 23 October 2009 in the UN Building in Bonn. Please check out: http://www.unoosa.org/oosa/en/unspider/workshops.html.

19th PAIGH General Assembly

October 26-30, 2009, Quito, Ecuador
URL: http://www.ipgh.org/19-Asamblea-General/AG-RTC-2.htm

SPRINGL'09

November 3, 2009, Seattle, USA
SPRINGL'09 - 2nd ACM International Workshop on Security and Privacy in GIS and LBS is co-located with 17th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM GIS 2009). SPRINGL 2009 is the second workshop in the SPRINGL workshop series that aims at bringing together researchers working on the foundations of the field and on novel applications bridging spatio-temporal

data management and security and privacy. Further details are available from the webpage http://www.cs.purdue.edu/homes/daic/springl09.

ACM GIS 2009

November 4-6, 2009, Seattle, USA
The ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems 2009 (ACM GIS 2009) is the seventeenth event of a series of symposia and workshops that began in 1993 with the aim of bringing together researchers, developers, users, and practitioners carrying out research and development in novel systems based on geo-spatial data and knowledge, and fostering interdisciplinary discussions and research in all aspects of geographic information systems. Visit http://acmgis09.cs.umn.edu for details.

International Cartography Conference

November 15-21, 2009, Santiago, Chile
URL: http://www.icc2009.cl/

Earth Observation and Water Cycle Science

November 18-20, 2009, Frascati, Italy
URL: http://www.congrex.nl/09c16/

AGU Fall Meeting 2009

December 14-18, 2009, San Francisco, USA
The Fall Meeting provides an opportunity for researchers, teachers, students, and consultants to review the latest issues affecting the Earth, the planets, and their environments in space. This meeting will cover topics in all areas of geophysical sciences including geodesy. Please visit http://www.agu.org/meetings/fm09/index.php for further details.

International VLBI Service for Geodesy and Astrometry (IVS) 2010 General Meeting

February 7-14, 2010, Hobart, Australia
The purpose of the meeting is to assemble representatives from all IVS components to share information, hear reports, and plan future activities. The meeting also provides a forum for interaction with other members of the VLBI and Earth science communities. The keynote of the sixth GM is the new perspectives of the next generation VLBI system under the theme "VLBI2010: From Vision to Reality". The content of the meeting will be of interest to the broad spectrum of IVS members as well as to the wider VLBI and Earth science community. URL: http://ivscc.gsfc.nasa.gov/meetings/gm2010

GEOProcessing 2010

February 10-15, 2010, St. Maarten, Netherlands Antilles
The Second International Conference on Advanced Geographic Information Systems, Applications, and Services will take place in St. Maarten, Netherlands Antilles from February 10-15, 2010. The topics suggested by the conference can be discussed in term of concepts, state of the art, research, standards, implementations, running experiments, applications, and industrial case studies. Authors are invited to submit complete unpublished papers, which are not under review in any other conference or journal in the following, but not limited to, topic areas. General page of the Conference is http://www.iaria.org/conferences2010/GEOProcessing10.html.

Munich Satellite Navigation Summit 2010

March 9-11, 2010, Munich, Germany
The Munich Satellite Navigation Summit 2010 – the eigth one – to be held March 9-11 2010 in the famous “Residenz München”, Germany – has been established as the European and International conference with global impact featuring invited high-ranking worldwide speakers from industry, science and governments dealing with the directions of satellite navigation now and in the future. For online registration and details please visit http://www.munich-satellite-navigation-summit.org.

EUREF Symposium 2010

June 2-5, 2010, Gävle, Sweden

The next EUREF Symposium will be held in Gävle, Sweden, June 2-5, 2010. See also http://www.euref.eu/. The homepage will be updated soon and from time to time be completed.

IAG Sister Societies' General Assemblies

XXIV FIG International Congress

April 11-16, 2010, Sydney, Australia
The FIG 2010 Congress, hosted by the International Federation of Surveyors (FIG) and Institution of Surveyors, Australia (ISA), is expected to bring together over 2,000 participants from almost 100 countries. The Congress will have a full professional program consisting of more than 80 technical and poster sessions, several workshops, pre-congress seminars, and special forums, including four plenary sessions focusing on the hot issues of the global agenda and of our profession: namely the big challenges of climate change, disaster risk management and good land governance; spatially enabled society; and different aspects of the technological futures. The webpage of the FIG 2010 Congress is www.fig2010.com.

Reports

Executive Report by the Local Organising Committee for the ABLOS 2009 International Seminar on "Technical Aspects of the Law of the Sea (TALOS)"

Advisory Board on the Law of the Sea (ABLOS)
August 3-5, 2009, Nusa Dua Bali, Indonesia

It was a great honour for Indonesia to host the 16th ABLOS Business Meeting in Bali, after a decision made at the 15th ABLOS Business Meeting in Monaco, 14-15 October 2008. Prior to the Business Meeting on 4-5 August, an International Seminar on the "Technical Aspects of the Law of the Sea (TALOS)" 2009 was held 3-4 August.

The **International Seminar on TALOS** was organised by the Boundary Mapping Center of BAKOSURTANAL (Coordinating Agency for Surveying & Mapping) in cooperation with the Director General (DG) for Legal and International Treaties of the Department of Foreign Affairs, and supported by the following organisations: the DG for Defense Strategy of the Department of Defense, the Indonesian Ocean Council, the Hydro-Oceanographic Office of the Indonesian Navy, the Agency for the Assessment and Application of Technology, the Indonesian Institute of Sciences, the Research & Development Agency of the Department of Energy and Mineral Resources, the DG for Public Administration of the Department of Home Affairs, the

Agency for Research of the Department of Marine and Fisheries, and the Deputy for State Defense of the Coordinating Ministry for Politics, Laws and Security. The seminar took place over one and half days, in the Westin Convention Hotel, Nusa Dua Bali, and was attended by 120 participants from 16 countries (including Indonesia). The international participants represented ABLOS, the UN-DOALOS (Department of Oean Affairs and the Law of the Sea), the International Hydrographic Organisation (IHO), the International Association of Geodesy (IAG), and the International Hydrographic Bureau (IHB), as well as many experts from Australia, Brazil, Canada, Chile, China, Greece, India, Indonesia, Japan, Malaysia, Monaco, New Zealand, Oman, Singapore, Taiwan, and the United Kingdom. Their backgrounds were varied, such as international law, law of the sea, geodesy, hydography, cartography, geology, geophysics, oceanography, fisheries, political geography, GIS, remote sensing and environmental management.

The theme of the seminar was "Problems and Challenges in Maritime Boundary Delimitation and the Role of Geospatial Data in UNCLOS 1982", and covered topics such as Maritime Delimitations, Charts and Geodetic Datums, Extended Continental Shelfs (Art. 76 UNCLOS 1982), Ocean Resources and Marine Environment, Climate Change, Global Warming and Sea Level Rise, as well as the role of Geospatial Data in relation to the UN Convention on the Law of the Sea. The seminar was organised into six sessions, i.e. Opening Session and Keynote Speech, Invited Paper Session, and four Technical Presentation Sessions. The Opening Session started by the report from the Organizing Committee, welcoming speech by the Chairman of ABLOS, welcoming and opening address by the Head of BAKOSURTANAL, followed by a keynote presentation by Ambassador Professor Dr. Hasyim Djalal. The Invited Paper Session had three speakers, Professor Etty R Agoes of the University of Pajajaran, Bandung; Professor Shin Tani of the Secretariat of the Headquarters for Ocean Policy, Cabinet Secretariat, Government of Japan; and Mr. Arif Havas Oegroseno, Director General for Legal and International Treaties of the Department of Foreign Affairs, Republic of Indonesia. The full list of papers and authors in the TALOS seminar are listed in the following table.

List of Invited Presentations

No	Author	Institution	Title
1.	Prof. Etty R Agoes	University of Padjajaran, Indonesia	The Need to Manage the Technical Aspects of the 1982 UNCLOS and Challenges for Indonesia
2.	Prof. Shin Tani	Secretariat of the Headquarters for Ocean Policy, Cabinet Secretariat, Government of Japan	Implementing Article 76 of UNCLOS in Geologically Complex Areas
3.	Arif Havas Oegroseno	Department of Foreign Affairs of the Republic of Indonesia	Indonesian Maritime Boundaries

List of Technical Presentations

No	Author	Institution	Title
1.	Evi Purwanti	Faculty of Law, University of Tanjungpura	Analysis on the Application of Baselines Regulation in Determining Maritime Boundary of a State According to *United Nations Convention on the Law of the Sea* 1982
2.	Sora Lokita, I Made Andi Arsana, Clive Schofield	The Australian National Centre for Ocean Resources and Security (ANCORS), University of Wollongong, Australia	The Use of Archipelagic Baseline in Maritime Boundary Delimitation
3.	F.Adm Sugeng Supriyanto, Capt. Trismadi,	The Indonesian *Naval* Hydrographic Office	Geodetic and Chart Datum Problem Arising from the

	LCdr.Muhammad Yazid, Leut. M Qisthi A		Map Annexure of the Maritime Boundary Treaties in Non-Wgs84 Datum (Lessons Learned from Indonesia-Singapore Case)
4.	Khafid and Agus Santoso	Center for Marine Base Mapping and Aeronautical Charting, BAKOSURTANAL	Implementation of Gardiner Formula for Determination of Indonesia Extended Continental Shelf
5.	Emily Artack and Andrick Lal	SOPAC Pacific Islands Applied Geoscience Commission	Implementation of UNCLOS Article 76 for the SOPAC Member Countries
6.	Khafid and Agus Santoso	Center for Marine Base Mapping and Aeronautical Charting, BAKOSURTANAL	Applying Mathematical Model to Identify Maximum Change of Gradient for Determination of Foot of Slopes in Indonesian Waters and its Surroundings
7.	Clive Schofield and I Made Andi Arsana	The Australian National Centre for Ocean Resources and Security (ANCORS), University of Wollongong, Australia	Outer Continental Shelf Submissions in Asia Pacific Region: Challenges and Opportunities
8.	Yanti Fristikawari	Faculty of Law, AtmaJaya Catholic University Jakarta	Prevention of Marine Pollution in Indonesia Conducted from Transportation Of Hazardous Material
9.	Kumala Hardja Widjaksana, Kris Budiono, I Wayan Nugra	Marine Geological Institute of Indonesia	Techtonogenesys of the Outermost of Small Islands of Indonesia: Its Implication to the Indonesian Maritime Boundaries
10.	Kris Budiono, Subaktian Lubis, Ediar Usman	Marine Geological Institute of Indonesia	Geological Setting and Mineral Resources & Energy Potency at ZEE of Indonesia
11.	Yusuf S. Djajadihardja Christope Gaedicke, Stefan Ladage Won Soh	Agency for the Assessment and Application of Technology-BPPT Bundessanstalt fur Geowisseschaften und Rohstoffe-BGR Japan Agency for Marine-Earth Science and Technology-JAMSTEC	The Unique Tectonics of Marine Geology of Indonesia
12.	A.Rimayanti, S. Lokita, T. Patmasari, K. Widodo	Center for Boundary Mapping, BAKOSURTANAL	The Role of Geospatial Data in Maritime Border Management
13.	S. Lévesque , S. Cockburn, O. Büchsenschütz-Nothdurft	CARIS	Software for Delineation And Management of Maritime Boundaries – Post May 13, 2009 Challenges
14.	Dewayany Sutrisno, Iramdi Nahib, Suseno, Anggoro Fitriyanto	Center for Marine Natural Resource, BAKOSURTANAL	Implementing the Role of Archipelagic State in the EEZ: A GIS Approach for Living Resources

15.	S. Marina, C. Purwanto, R. Rahardiawan, Susilohadi	Marine Geological Institute of Indonesia	Geomarine III: A New Tool for Supporting Indonesian Continental Shelf Claim

CHRIS RIZOS

Brief Report on the IAG2009 Scientific Assembly

August 31 –September 4, 2009, Buenos Aires, Argentina

The IAG 2009 Scientific Assembly was held in Buenos Aires, Argentina the week of 31 August to 4 September 2009. The theme of the Assembly was "Geodesy for Planet Earth" and follows the UN declaration of 2008 being the International Year of Planet Earth. It was an memorable event, bringing together scientists from over 65 countries and offering 8 full Sessions over the 5 days of the Assembly. The Opening Ceremony included an address by Dr. Tom Beer, the IUGG President, who gave an overview of IUGG and how the 8 Scientific Associations: geodesy, volcanology, seismology, meteorology, oceanography, hydrology, cryospheric sciences as well as geomagnetism and aeronomy (the study of the upper atmosphere) are contributing to our knowledge of the Planet.

The 8 Sessions of the IAG 2009 Assembly included the 4 IAG Commission areas: Reference Frames, Gravity, Geodynamics, and Positioning and Remote Sensing and four more Sessions of prime interest to the geodetic community: Global Geodetic Observing System (GGOS), Geodesy of Latin America, IAG Services, and the sister organizations to geodesy ION/FIG/ISPRS. More than 400 oral and poster presentations were delivered during the week and all made a substantial contribution to our knowledge of geodesy and related disciplines and improving our understanding of the changes on-going with Planet Earth.

There were many highlights from the Scientific Program that demonstrate geodesy in making important contributions to climate change, geohazards, and understanding the mass transport between land, oceans, atmosphere, and ice covered regions. The sequence of space gravity missions (CHAMP, GRACE, GOCE) combined with terrestrial GPS networks are providing new levels of accuracy in climate and geodynamical changes. GGOS, the flagship of the IAG, is actively moving forward with the development of next generation geodetic networks and integrating the 3 pillars of geodesy: geometry, earth rotation, and gravimetry to develop a new geodetic reference frame with an accuracy goal to 1 millimeter, which is critical for measuring the changes in mean sea level and other quantities affected by climate change. Geodesy is leading the way in developing techniques to predict earthquakes, tsunamis, and other geohazards such as volcanoes. The Program also allowed us to focus on Latin American geodetic activities and learn about the progress of SIRGAS and other initiatives. Those were just a few of the highlights that were presented and discussed during the Assembly. Argentina was a great host to this Assembly and has been a long-term active participant in the IUGG and IAG. Many thanks to the LOC headed by Dr. Maria Cristina Pacino of the University of Rosario, Argentina for all their tremendous work in organizing this Scientific Assembly. The next IAG Scientific Assembly is planned for 2013 and the location will be decided at the next IUGG Assembly being held in Melbourne, Australia in July 2011.

STEVE KENYON
Chair of the Scientific Committee

Report on the 2009 General Meeting of SIRGAS: Geocentric Reference System for the Americas

SIRGAS (Sistema de Referencia Geocéntrico para las Américas) is responsible for the definition, realization, and maintenance of the 3D geocentric reference system for Latin America and the Caribbean, including a gravity field-related vertical reference system. This responsibility comprises: Determination and maintenance of a continental geocentric reference frame as a regional densification of the global ITRF; establishment of high-precise national geodetic reference networks as SIRGAS densification in the member countries; and definition/realization of a unified vertical reference system composed by physical and geometrical heights consistent world-wide.

SIRGAS is the backbone for all projects related to geo-spatial information in the region. It supports the development of practical applications such as land management, engineering projects, digital administration of geographical data, geospatial data infrastructures, etc., as well as a wide range of scientific applications such as monitoring crustal deformations, vertical movements, sea level variations, atmospheric studies, observation and measuring of global change effects, etc.

SIRGAS is a component of the International Association of Geodesy (IAG) through the Commission 1 (Reference Frames), Sub-commission 1.3 (Regional Reference Frames), being responsible for the Regional Reference Frame for South- and Central America (1.3b). SIRGAS is also a Working Group of the Cartographic Commission of the Pan American Institute for Geography and History (PAIGH).

Activities, advances, and new challenges of SIRGAS are reported, discussed, and re-oriented (if necessary) in the SIRGAS yearly meetings, which have been realized since 1993. The last one was carried out within the Scientific Assembly of the International Association of Geodesy (IAG) -"Geodesy for Planet Earth"-, held from August 31 to September 4, 2009 in Buenos Aires, Argentina. Since the scientific program of the Assembly covered all SIRGAS objectives, SIRGAS did not conduct a parallel meeting but all its contributions were submitted and presented at the different IAG Assembly sessions.

In about 30 oral presentations and 20 posters, the following SIRGAS issues were presented during the IAG Assembly:

- Densification, operational improvement, and analysis of the SIRGAS Continuously Operating Network (SIRGAS-CON);
- Atmospheric studies (troposphere + ionosphere) based on the SIRGAS infrastructure;
- Extension of SIRGAS in Central America and the Caribbean;
- National achievements by adopting and using SIRGAS as official reference frame;
- Advances in the definition and implementation of the SIRGAS vertical reference system within a global concept;
- GNSS applications in real time;
- Interaction SIRGAS - GGOS (Global Geodetic Observing System).

Most of the SIRGAS contributions will be submitted to the proceedings for the IAG 2009 Scientific Assembly, which are planned to be part of the IAG Symposia Series. Additionally, a detailed report containing the oral presentations and posters will be available, as usual, at the SIRGAS web site (www.sirgas.org).

Complementary to the scientific presentations, the Annual Meeting of the SIRGAS Executive Committee took place on September 1, 2009, covering the following themes (full information will be soon available at www.sirgas.org):

- Report of SIRGAS President
  - Main activities achieved during the last year;
  - Changes in the Executive Committee (new National Representatives);
  - Participation of SIRGAS in international working groups and meetings;
  - Announcement of the SIRGAS 2010 General Meeting.

- Report of the SIRGAS Working Groups
  - SIRGAS-WGI (Reference System): New experimental processing centres, new multi year solution for the SIRGAS-CON network, atmospheric studies based on the SIRGAS infrastructure (SIRGAS-ION), coming activities;
  - SIRGAS-WGII (Geocentric Datum): New national densifications of SIRGAS, first IAG/PAIGH/SIRGAS School on Reference Systems, SIRGAS Real Time, integration of Central American and the Caribbean countries into SIRGAS, coming activities;
  - SIRGAS-GTIII (Vertical Datum): Towards geopotential numbers computation in a continental level, realization of the reference surface, coming activities.

- Availability and distribution of the SIRGAS products: SIRGAS in the Internet, maintenance of the SIRGAS web site, use of the SIRGAS products.

The main conclusions and recommendations of the SIRGAS 2009 General Meeting are:

1. The analysis strategy of the SIRGAS-CON network, based on the individual processing of one core network and three densification networks and their combination in a unified solution, demonstrated to be very efficient. The four SIRGAS Official Processing Centres (IGAC, Colombia; IBGE, Brazil; CIMA, Argentina; and DGFI, Germany) satisfy the administrative and quality processing requirements defined in the SIRGAS guidelines, which are consistent with the IGS and IERS standards. Their weekly solutions are at the same accuracy level with respect to each other and with respect to final weekly combinations.

2. The main SIRGAS-CON products (i.e. loosely constrained weekly solutions for the IGS polyhedron and weekly positions aligned to the IGS05) present a precision (internal consistency) of about ±0,8 mm for the horizontal position and ±2,5 mm for the vertical one, while the realization accuracy with respect to the IGS05 frame (external consistency) is about ±1,5 mm for the horizontal component and ±3,8 mm for the vertical one.
3. A new multi-annual solution, identified as SIR09P01, for the SIRGAS-CON network was released in June 2009. It covers all the weekly solutions provided by the SIRGAS Analysis Centres from January 2, 2000 (GPS week 1043) to January 3, 2009 (GPS week 1512). It is referred to IGS05 at 2005.0. The precision of its positions at the reference epoch is estimated to be better than ±0,5 mm in the horizontal component and ±0,9 mm in the vertical one. The precision of the linear velocities is about ±0,8 mm/a. A loosely constrained version of this solution was delivered as the SIRGAS contribution to the IAG SC1.3 Working Group on Regional Dense Velocity Fields.
4. The availability of horizontal velocities in those regions which are not covered by SIRGAS-CON stations is strongly improved through the new Velocity Model for South America and the Caribbean (VEMOS 2009), which represents the continuous present-day deformation of the Earth's crust in the SIRGAS region. It is based on nearly 500 velocity stations observed in 13 GPS projects. The overall precision of the point velocities is better than ± 1 mm/a in South-North and about ± 1,5 mm/a in West-East direction.
5. The SIRGAS-WGI outlined a conventional strategy to define the geodetic datum within the SIRGAS-CON weekly solutions. This strategy shall be applied by the SIRGAS Combination Centres (IBGE, Brazil, and DGFI, Germany) to generate weekly positions aligned to the IGS05 frame. The datum definition strategy is based on constraining the coordinates of the IGS05 stations to their positions resulting of the IGS weekly combinations (igs*yy*P*wwww*.snx). The applied constraint shall correspond to a weight inversely proportional to the internal variance of the GPS measurements. Explicitly, the application of linear velocities to obtain reference coordinates for the datum definition is not recommended by SIRGAS.
6. The requirement of redundancy in the processing of the SIRGAS-CON stations (each station processed by at least three analysis centres) is being faced by installing more SIRGAS Processing Centres hosted by Latin American institutions. In this year, three Experimental Centres started operations: Instituto Geográfico Militar of Ecuador (IGM, Ecuador), Laboratorio de Geodesia Física y Satelital at the Universidad del Zulia (LGFS-LUZ), and Servicio Geográfico Militar of Uruguay (SGM, Uruguay). Once they pass a validation period of one year, they become official processing centres and their weekly solutions will be included in the generation of the SIRGAS-CON official products.

7. Until now, the SIRGAS Analysis Centres process GPS data only. Since the number of GLONASS stations is increasing in the SIRGAS region, the SIRGAS-WGI initiates the routine processing of GLONASS observations in a weekly basis. All GLONASS stations will be analysed as an individual network, loosely constrained solutions of which will be combined with the similar solutions generated for the other SIRGAS-CON sub-networks. The analysis of the GLONASS data will be carried out by the Processing Centre CIMA (Argentina).
8. Two additional national networks were integrated into SIRGAS improving the accessibility of this continental frame at national level. In Argentina: Posiciones Geodésicas Argentinas (POSGAR07) refers to the ITRF2005, epoch 2006.6. The datum definition was realized by means of the multi-year solution DGFI08P01 for the SIRGAS-CON network. The corresponding analysis was carried out by the Instituto Geográfico Nacional of Argentina using the software GAMIT-GLOBAL K. In El Salvador: The frame SIRGAS-ES2007.8 (SIRGAS El Salvador 2007.8) refers to the IGS05, epoch 2007.8. The datum definition is given by constraining the weekly coordinates of the SIRGAS-CON network at the observation epoch. The analysis was carried out by the Deutsches Geodätisches Forschungsinstitut using the Bernese Software.
9. Different capacity building tools have been implemented in the member countries with the purpose of supporting the adequate realization and use of SIRGAS as reference frame. One of the most successful is the IAG/PAIGH/SIRGAS School on Reference Systems, which aims to provide the attendant with theoretical concepts needed for the appropriate production and use of fundamental geodetic data. The first edition of this school was held in Bogotá (Colombia), from July 13 to 17, 2009 with 120 participants representing 12 countries of Latin America and the Caribbean. The next school will be carried out together with the SIRGAS 2010 General Meeting in Lima, Peru.
10. The SIRGAS Real Time (SIRGAS-RT) project was established in the SIRGAS 2008 General Meeting (May 2008). Its main objective is to evaluate the possibility of providing near real time corrections for GNSS positioning based on the SIRGAS-CON stations. After one year, Brazil, Uruguay, and Venezuela, who are applying the NTRIP tool, show significant advances in this topic, and the SIRGAS-WGII will continue promoting the development of similar studies in the other SIRGAS countries.

11. The routine production of vTEC maps for South America by the Universidad Nacional de la Plata (Argentina) as SIRGAS Ionosphere Analysis Centre provides control and improvement for different kind of projects such as the International Reference Ionosphere (IRI) over South America, positioning with single-frequency GPS receivers, and the feasibility of computing ionospheric corrections for a satellite based augmentation system (SBAS) for the region.
12. Regarding the definition and realization of a unified vertical reference system for SIRGAS, it should be mentioned that the Latin American countries continue preparing the levelling data to be processed in a continent-wide adjustment. The SIRGAS-WGIII analyses at present geopotential numbers of Colombia, Venezuela, Brazil, Ecuador, Uruguay, Argentina, and Chile. Bolivia, Peru, and Paraguay will provide the corresponding data in the next future.

Thanks to a kind invitation of the Instituto Geográfico Nacional of Peru, the SIRGAS 2010 General Meeting will be held in November 2010 in Lima, in the frame of the 42 Annual Meeting of the Directing Council of PAIGH.

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CLAUDIO BRUNINI, SIRGAS President
LAURA SÁNCHEZ, SIRGAS Vicepresident

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 August 2009). 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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