



SIRGAS General Meeting 2012 and SIRGAS-IAG-PAIGH School on Real Time GNSS Positioning

Concepción, Chile, October 24 - 31, 2012

- Meeting Summary -

The IAG Sub-Commission 1.3b, SIRGAS, held its annual meeting in Concepción, Chile, from October 29 to 31, 2012. This meeting included two complementary activities: a SIRGAS/IAG/PAIGH School on real time GNSS positioning from October 24 to 26, and a technical visit of the TIGO (*Transportable Integrated Geodetic Observatory*) facilities. In total, 16 countries were represented: 50 participants attended the School and 135 attendees participated in the Meeting and the technical visit to TIGO.

The program developed within the School encompassed: General concepts on GNSS positioning; real time GNSS measurements; RTCM format; NTRIP protocol; mobile communication systems supporting NTRIP; real time precise point positioning (RT-PPP) methods; real time kinematics (RTK) and networked RTK methods, strengths and weaknesses of real time positioning; present and future applications of real time positioning; real time positioning based on the SIRGAS infrastructure.

The SIRGAS General Meeting 2012 was devoted to present the achievements of the SIRGAS components during the last year, including reports from the Working Groups, the Specific Projects and the National Representatives of the SIRGAS Directing Council. The main topics addressed where: maintenance of the SIRGAS reference frame (17 contributions); contributions of SIRGAS to System Earth measurement and analysis (15); real time GNSS positioning based on the SIRGAS infrastructure (9); advances in the establishment of a globally consistent vertical reference system for SIRGAS (12); practical applications of the SIRGAS reference frame at the national level (19). In addition, the IAG representative to SIRGAS presented an invited speech on the 150 year anniversary of the Association.



*Attendees of the SIRGAS General Meeting 2012,
Concepción, Chile, October 29 to 31, 2012.*

Fifty one oral and twenty three poster presentations were accepted by the Scientific Committee; one oral and six poster contributions were cancelled due to problems unrelated to the organization. The presentations comprised: reports of the ten Analysis Centres, the two Combination Centres and the Ionosphere Analysis Centre; reports from the chairpersons of the Working Groups I (Reference System), II (National Activities) and III (Vertical Datum); and reports from the national representatives of Argentina, Bolivia,



Chile, Colombia, Costa Rica, Ecuador, Guatemala, Mexico, Panama, Peru, Uruguay, and Venezuela.

The main conclusions of the meeting may be summarized as follow:

- The SIRGAS reference frame is officially adopted by most of the countries, which are establishing national densifications of the continental network. Remarkable efforts have been done during the last year in Bolivia, Guatemala and Peru.
- A new Local Analysis Centre for SIRGAS has been installed by the Chilean Geographical Institute (IGM) and, after a successful test of one year, it will start operations as an official SIRGAS Analysis Centre in January 1, 2013.
- Institutions from Costa Rica, Bolivia and Peru will start soon a training period to install new SIRGAS Local Analysis Centres in those countries.
- Several countries reported improvements on their first order levelling networks. It was agreed to hold a workshop on the continental adjustment of these networks in December 2012 at the *Instituto Brasileiro de Geografia e Estatística* (Rio de Janeiro, Brazil) under the coordination of the SIRGAS Working Group III;
- The Ionosphere Analysis Centre of SIRGAS presented a new modelling strategy to compute regional maps of electron density;
- The specific projects installed by SIRGAS reported advances on
 - modelling of non-linear movements in the SIRGAS frame determination,
 - combined analysis of GPS and GLONASS data within the SIRGAS reference frame,
 - improvement of the SIRGAS infrastructure for real time GNSS positioning,
 - computation of perceptible water vapour regional maps.

TIGO is a unique geodetic facility in Latin America comprising co-located VLBI, SLR and GNSS instruments and other high-performance geodetic techniques. The doors of TIGO were generously opened to the SIRGAS community who, in addition to visit to the instruments, received high-qualified explanations provided by the TIGO staff. Among others, the following topics were addressed: General overview of TIGO; the VLBI system; GNSS instruments; the global climate change measured by TIGO; black holes and SMART-1 impact on the Moon observed by TIGO; the SLR system; first SLR measurement of Galileo satellites; the time system of TIGO and its contribution to the BIPM; the absolute and super-conducting gravimeters of TIGO; the LIDAR system; TIGO after the Maule earthquake, 27 February 2010. A set of posters used by the TIGO staff in support of this visit are available at http://www.tigo.cl/index.php?option=com_content&view=article&id=94&Itemid=212&lang=es.

Many institutions cooperated to make the 2012 SIRGAS Meeting and School possible. The SIRGAS community particularly recognized the *International Association of Geodesy* and the *Pan American Institute of Geography and History* for supporting the assistance of 17 Latin American colleagues; the *Universidad de Concepción* and the *Instituto Geográfico Militar* of Chile for providing the local organization; the *Bundesamt für Kartographie und Geodäsie* (BKG), together with the *Universidad de la República* (Uruguay) and the *Universidad Nacional de Rosario* (Argentina), for supporting the lecturers of the SIRGAS School; the TIGO team for hosting a fruitful technical visit; the German-Chilean Project "*Geodätisches Beobachtungs- und Auswertesystem in seismisch aktiven Gebieten Chiles*" for supporting the attendance of the SIRGAS Vice-President and the IAG Representative to SIRGAS.

More details about the SIRGAS 2012 General Meeting and the SIRGAS/IAG/PAIGH School on GNSS Positioning in Real Time may be found at www.sirgas.org.

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