Recent achievements and current challenges in the maintenance of the geodetic reference frame of the Americas

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Outline

• What is SIRGAS?
• SIRGAS’ objectives
• SIRGAS’ Working Groups
• Recent achievements
• Current challenges
• Products
What is SIRGAS?

SIRGAS is a non-profit organization based on the voluntary contribution of scientific organizations and the national geodetic, cartographic or geographic agencies of the member countries.

SIRGAS was established in 1993 with the purpose of replacing (or modernizing) the classical geodetic datums with a unified geocentric reference frame called SIRGAS: Geocentric Reference System for the Americas.

This purpose was extended in 1998 to also include the determination of a vertical reference system associated with the Earth’s gravity field.

Currently, the main objective of the SIRGAS organization is to promote the growth, development, sustainability and proper use of the SIRGAS reference frame in Latin America.
SIRGAS forms part of the IAG Commission I (Reference Frames), through the Sub-commission 1.3 (Regional Reference Frames), and it is 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 PAIGH.
SIRGAS’ objectives

SIRGAS, as organization, takes care of realizing and maintaining a tri-dimensional geocentric reference system for Americas, including a unified gravity field-related vertical reference system with global consistency.

This objective includes:

a) Definition of a tridimensional Cartesian geocentric reference system.

b) Realization and maintenance of a Cartesian geocentric reference frame (network of stations with high-precise geocentric coordinates \([X, Y, Z]\) and their variation with time \([V_X, V_Y, V_Z]\)).

c) Densification of the continental reference frame in the SIRGAS member countries, as well as the promotion and support of its utilization in practical and scientific applications.

d) Definition and realization of a unified vertical reference system based on the consistent combination of physical and geometric heights, including the determination of the reference frame variations with time.

SIRGAS is a non-profit organisation and its activities are possible thanks the voluntary contribution of more than 50 Latin American agencies and universities.

Source: www.sirgas.org
Recent achievements

a) Reprocessing of the SIRGAS reference network based on the ITRF2014 (IGS14 / IGb14)

Motivation

Need to update the SIRGAS reference frame to the new ITRF.

Currently Situation

Once the analysis of the time series is finished, the determination (adjustment) of weekly coordinates will begin in the IGb14 reference frame. A comprehensive multi-year solution will be calculated (2000.0 to 2020.5) and the results will be published on www.sirgas.org and ftp.sirgas.org.

Recent achievements

b) Extension of the SIRGAS network

At the request of NGS (National Geodetic Survey) and to help support GRFA activities (Geodetic Reference Frame for Americas) working group, established in the framework of the Regional Committee of the United Nations on Global Geospatial Information Management for the Americas (UN-GGIM: Americas), since GPS week 2151, the SIRGAS network was extended to North América.
Main challenges in SIRGAS today

• To make the participation of the countries bigger in the CARIGEO area
• Add more stations to the SIRGASCON network and implement 3 or more analysis center: PER, CRI
• Calculation of transformation parameters between different realization of SIRGAS (Ongoing effort between WG 1 and WG 2)
• To continue with the training courses by WG 1, WG 2 and WG 3
SIRGAS-CON is a network of GNSS stations with continuous operation distributed over Latin America, with high precision ITRF (International Terrestrial Reference Frame) coordinates. The operability of SIRGAS-CON is possible thanks to the voluntary contribution of more than 50 Latin American organizations that guarantee the reliability and long-term stability of the network through redundancy and the application of precise guidelines that ensure the quality of GNSS measurements, scientific processing data and the coordinates obtained for each reference station. SIRGAS provides the following products:

- Weekly station positions
- Station positions and velocities (multi-year solutions)
- Continuous velocity model VEMOS (Velocity Model for SIRGAS)
- Tropospheric delays
- Regional ionospheric maps
- Real time Caster Services

Source: www.sirgas.org
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Thank you
Muchas gracias
Muito obrigado

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