Advances in the implementation of the UN Resolution on Global Geodetic Reference Frame in Argentina

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The role of the GGRF in the GSDI

But not for all …
What does the GGRF imply?

A geometrical reference frame ‘fixed’ in the space realized by quasars

Parameters to link the celestial and terrestrial frames

A geometrical reference frame realized by tracking stations on the ‘continuously moving’ Earth’s crust
How the GGRF is realized?

Recognizing the key role played by the GGRF for the sustainable human development and the need of strengthen the global organization in-charged of its realization, in February 2015 the UN promulgated the GGRF Resolution encouraging its member state to consolidate the global infrastructure needed for its realization.
The Argentinean – German Geodetic Observatory

It is one of the most complete geodetic observatory in the world and its strategy location in the Southern Hemisphere makes it a key piece for improving the GGRF world wide and, overall, regionally.
AGGO’s instruments
Time and frequency laboratory

2 H-masers
$10^{-15}$ over days

3 Cesium beams
$10^{-14}$ over months

GNSS time synchronization
AGGO’s instruments

Absolute and relative (superconducting) gravity meter.

Both together achieve a sensibility greater than 0.1 nm / s^2
AGGO’s instruments

Very Long Baseline Interferometry (VLBI)

6 m dish
2 bands (S and X)

Baseline (1,000 – 12,000 km)

Time delay (3 – 50 ms)

Radio source positions
Radio telescope positions
Earth orientation parameters

Frequency, amplitude, phase, time delay and drift

Clock
Adquisitor
Correlator
Adquisitor
Clock
AGGO’s instruments

Satellite Laser Ranging (SLR)

50 cm telescope
Sapphire - titanium laser (847 and 423.5 nm)
Pulses repetition: 100 Hz
Width: 40 ps
Energy: 15 mJ

range = speed of light × \frac{\text{round trip time}}{2}
AGGO’s instruments

Multi constellation ensemble of GNSS receivers

Meteorology, hydrology, sysmology and a variety of environmental sensors
Closing remarks

Observing facilities in Latin America include:

- A dense and well organized GNSS network, namely SIRGAS;
- Three SLR and one VLBI stations, all co-located with GNSS;
- The AGGO station where all geodetic techniques are co-located.

For many years, Latin American institutions were mostly involved as data provider.

In the last ten years several Latin American countries have developed ‘in-house’ capabilities for the realization of the GGRF based on GNSS data.

The time is coming to extend this capability to the other techniques, i.e., SLR and VLBI.

A well coordinate capacity building (with help from the international community) has to be established to guarantee homogenous advances in the region.

Could it be a topic for discussion in this workshop?
July 2015, Official opening of AGGO with the presence of the Ministers of Argentina and Germany and the Presidents of CONICET and BKG

Panorama view of AGGO
Many thanks