

Approach of SIRGAS to other Space Geodesic Techniques

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Simposio SIRGAS2017

Astrometry



Geodesy

Space Techniques of Measurement



VLBI



SLR



GNSS



DORIS

First SLR Station in Argentina: SAN JUAN ILRS 7406

- International Agreement between our University and the National Observatory of the Chinese Academy of Sciences
- Officially started on February 22nd 2006 and the ILRS provided the code 7406



First South American SLR Workshop (2009) San Juan Argentina



South American stations:

- 7403 Arequipa (1989)
- 7405 TIGO (2002)
- 7406 San Juan (2006)

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Attendees at the meeting

Chronology of the approach of SIRGAS to other Space Geodesic Techniques:

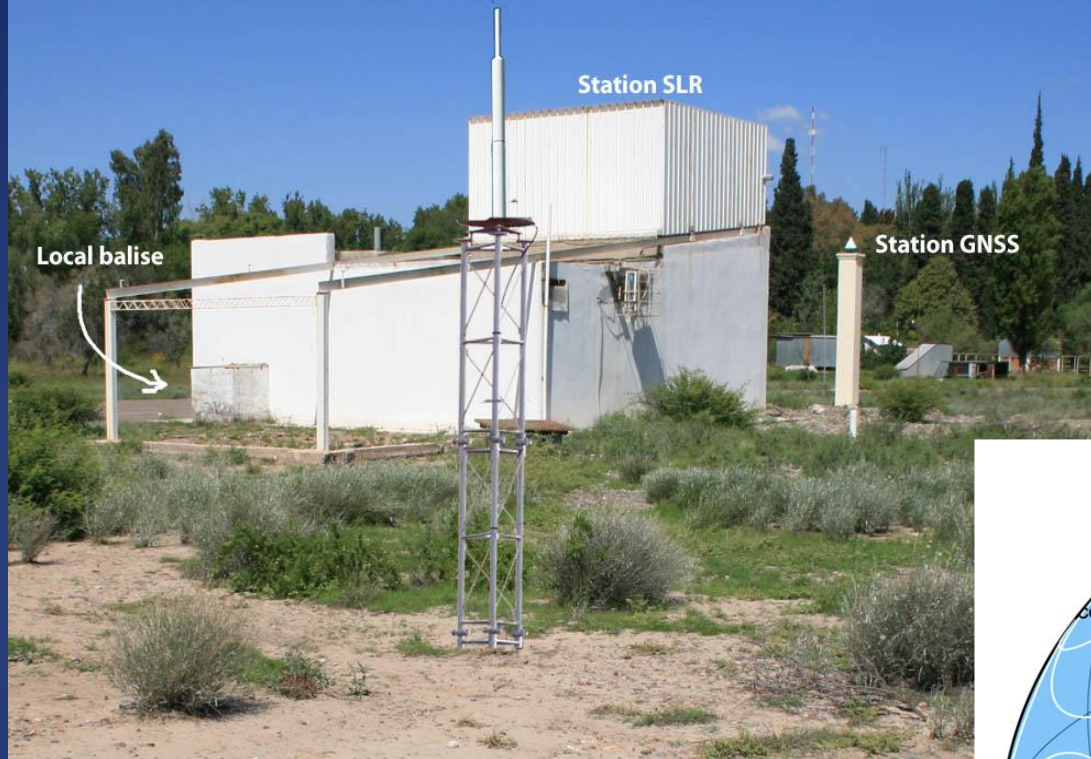
- 2010 Invitation to SIRGAS for Claudio Brunini (President of the Executive Committee)
- 2012 1st Presentation of the ILRS 7406 Concepción - Chile
- 2013 First time (within the SIRGAS program) a Session of Space Geodesic Techniques (Panamá)
- 2015 Dominican Republic – Santo Domingo:
SLR SIRGAS Data Processing
- 2016 Grupo Bernese Cuyano

Space Geodesy Stations in South America



- 1 station with SLR/VLBI/GNSS
(AGGO)
- 1 station with VLBI/GNSS
(Fortaleza)
- 1 station with SLR/DORIS/GNSS
(Perú)
- 3 stations with DORIS/GNSS
(Kourou, Cachoeira and Rio Grande)
- 1 stations with
SLR/**DORIS**/GNSS/**VLBI**
(Oafa)

Optimum place for DORIS transmitter at OAFA



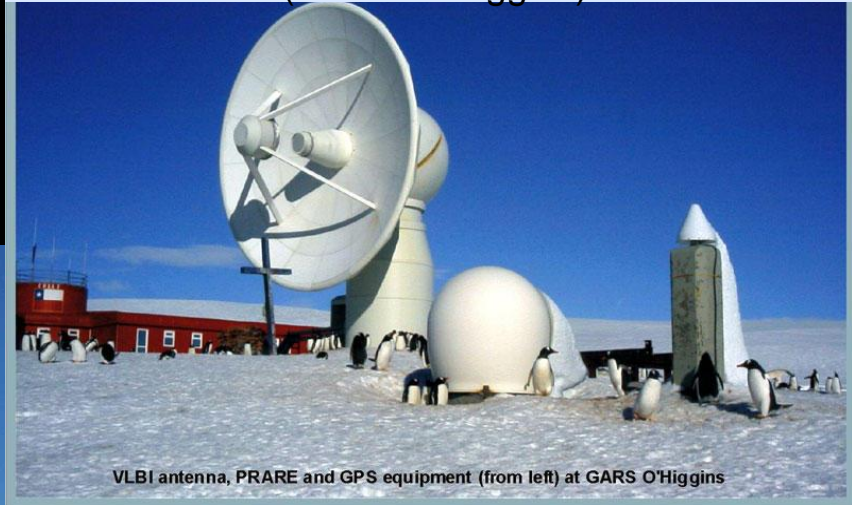
*Similar sky recovering
in Santiago and
San Juan*



El Radio Observatorio Espacial do Nordeste ROEN (FORTALEZA)



German Antarctic Receiving Station (GARS-O'Higgins)



VLBI antenna, PRARE and GPS equipment (from left) at GARS O'Higgins



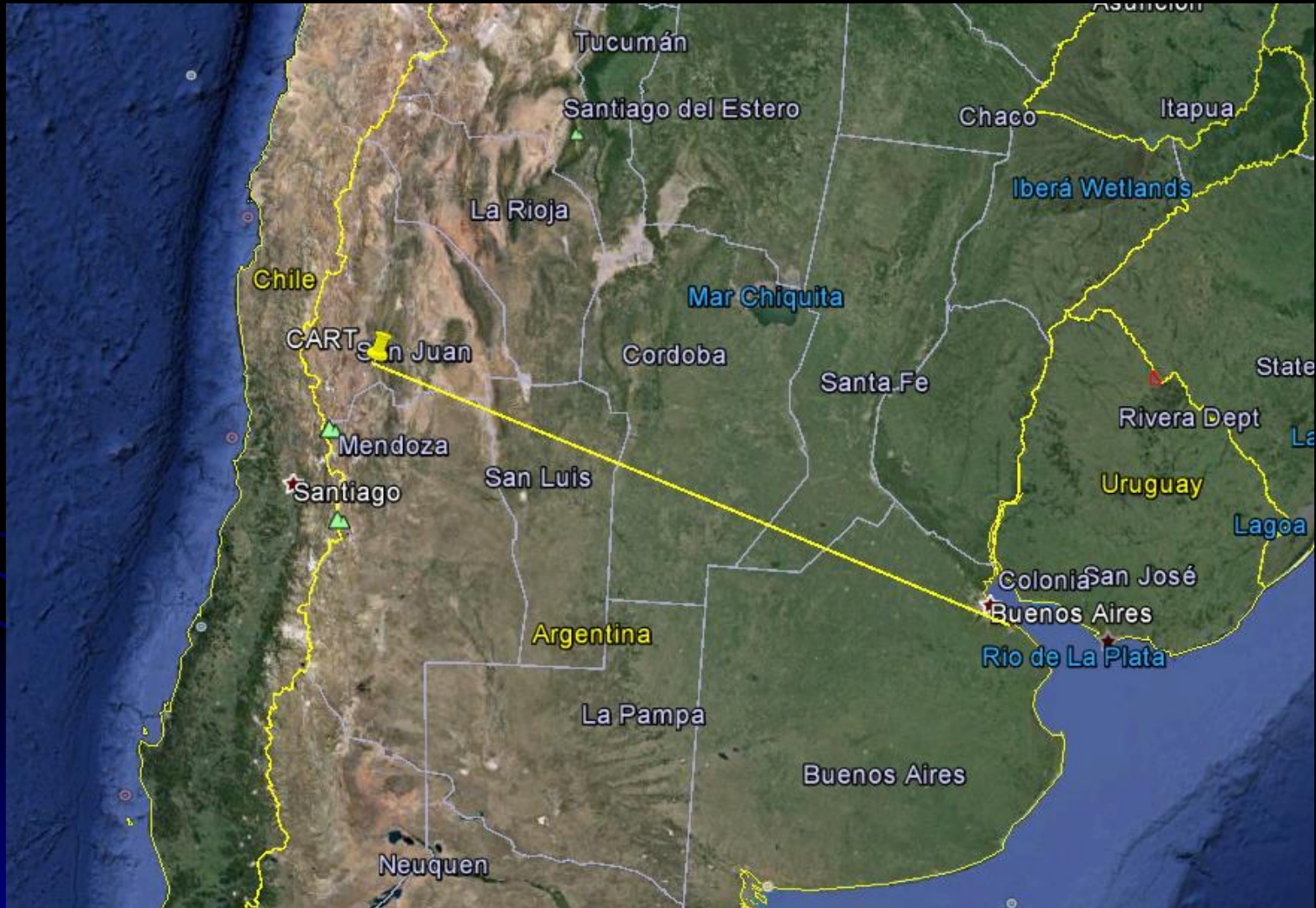
AGGO Argentine-German Geodetic Observatory

China-Argentina Radio Telescope (CART)



Consist in a 40 meters telescope to be placed in San Juan for observation of radio frequencies between 1 Ghz and 45 Ghz from the Southern hemisphere.

Where?



Station: CARLOS U. CESCO



Station: CARLOS U. CESCO

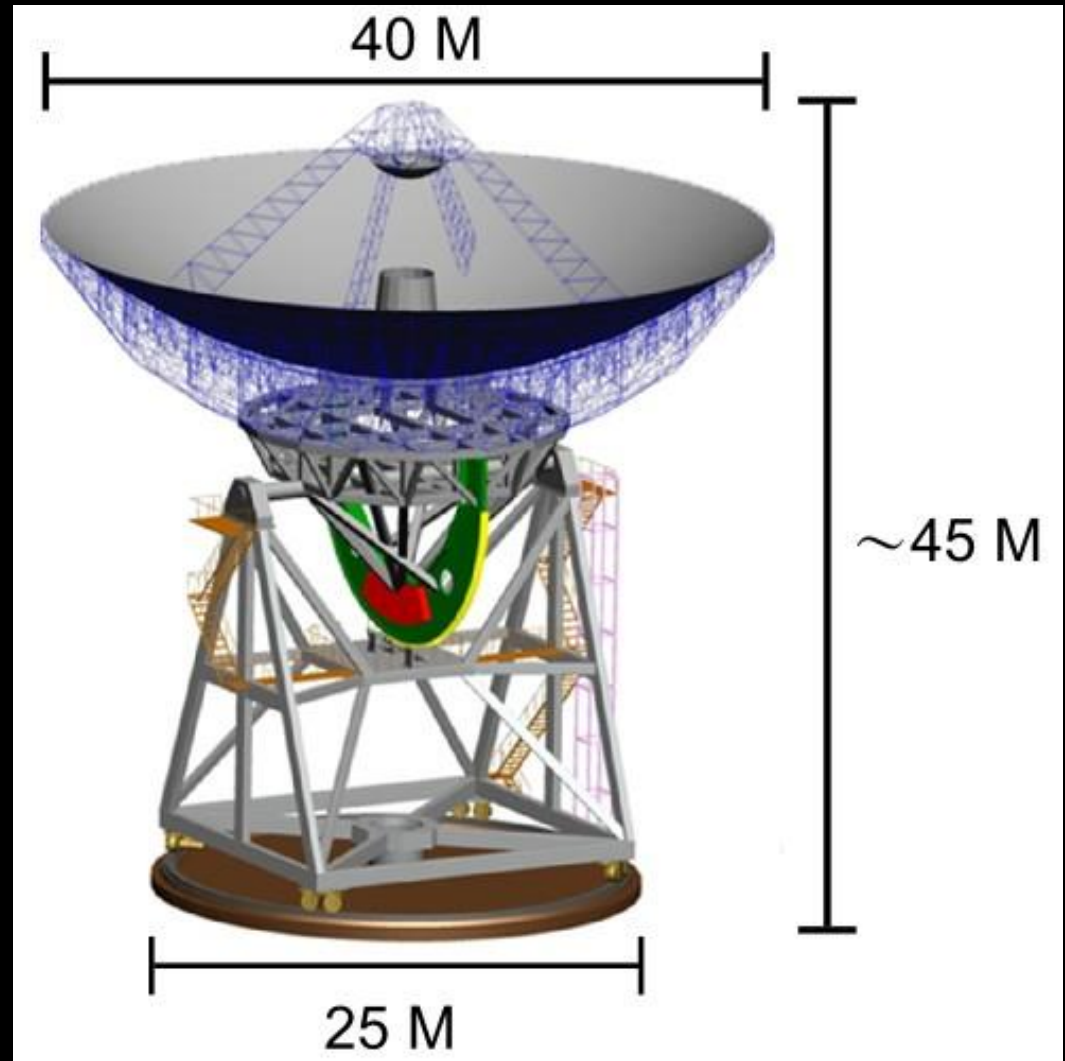


NOW



Brief Facts

- 40M Diameter Full Steerable Antenna with Shaped High Efficiency Symmetric Reflector working up to 45 GHz
- Fast Band shifting by shaped Asymmetric sub-reflector rotation
- State-of-Art Cryogenic LNA and Dual Polarization Receiver for S/X band

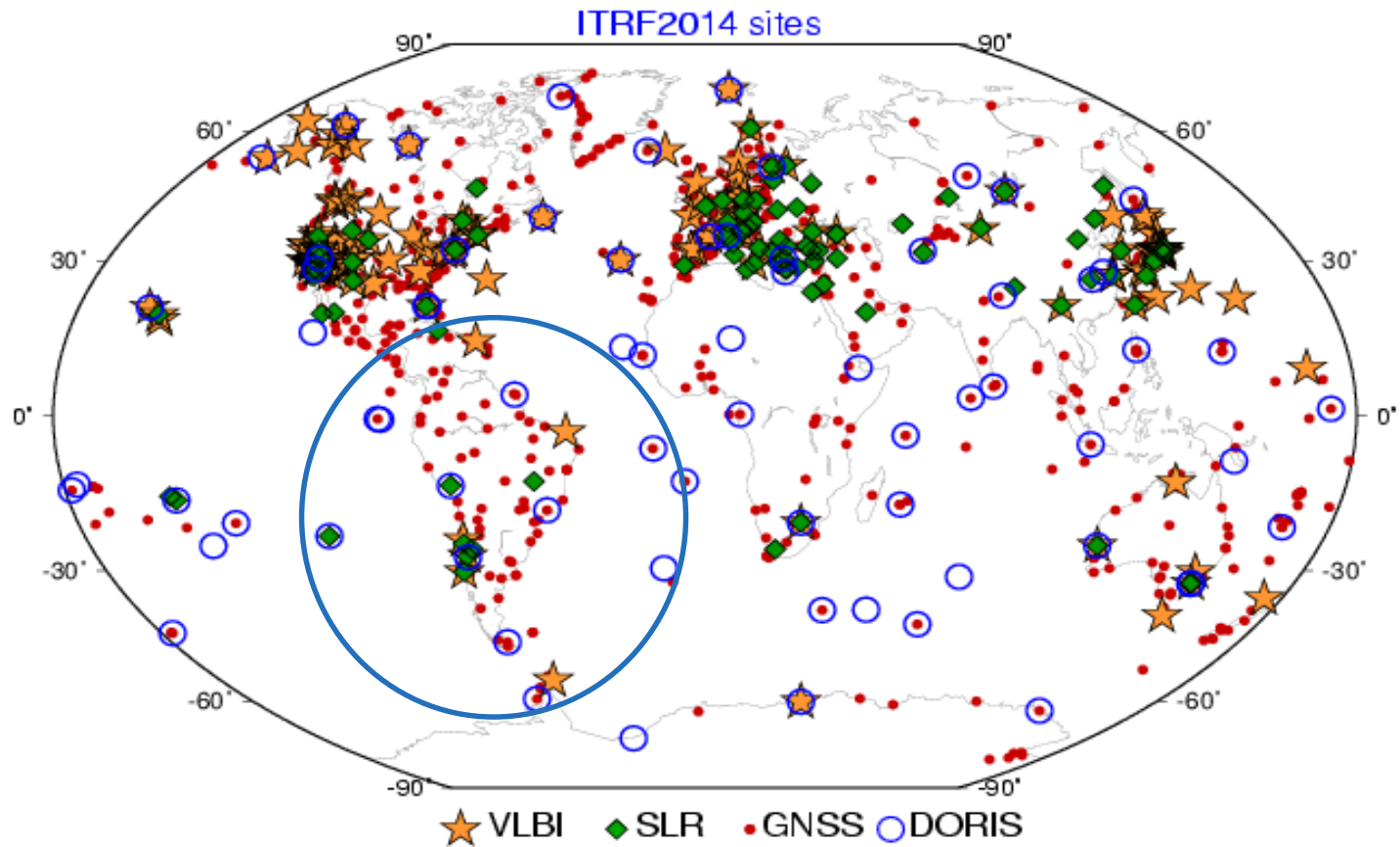


CART Potential Science Objectives

- Establishment and Maintenance of ICRF, ITRF and SIRGAS
- To link between the frameworks of radio and frameworks established in other wavelengths
- Determination of EOP
- Geodynamic studies of the crust of the Earth - Movement tectonic plates of the Earth.

- Study of radio and variations of structure
- Investigating the redshift of AGN
- Observations of X-ray binaries, supernovae and novae wrap.
- To study activities of solar objects, e.g. planets and asteroids
- To investigate the formation and evolution of molecular clouds
- To study the feedback of expanding HII regions
- To investigate the circumstellar medium around evolved stars.
- Hunting for Fast Radio Burst
- Timing observations of pulsars
- Investigations of interstellar masers
- Polarization of galaxy clusters
- Contribute to space exploration, participating Chinese Lunar Exploration Program

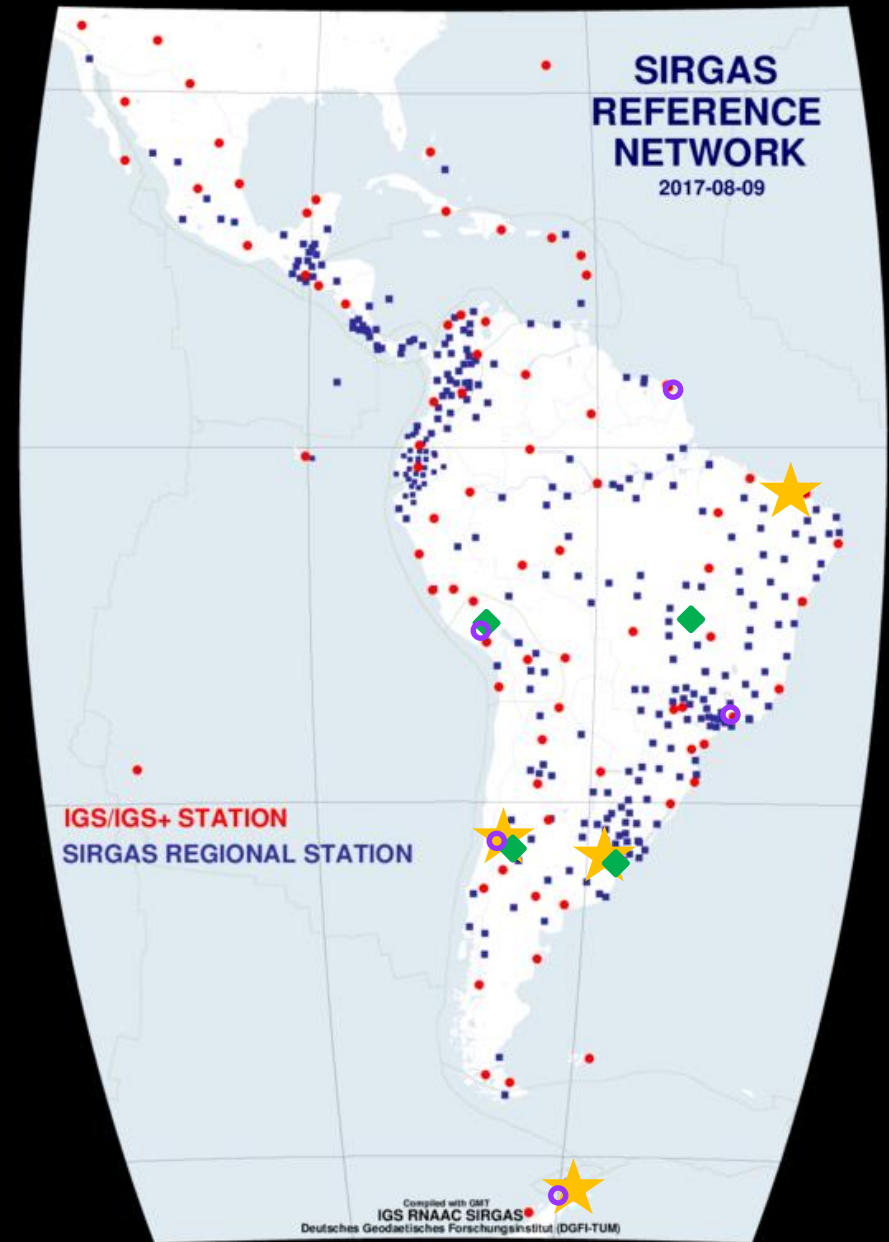
ITRF International Terrestrial Reference Frame



SIRGAS

SIRGAS (1993) como sistema de referencia se define idéntico al Sistema Internacional de Referencia Terrestre ITRS (International Terrestrial Reference System) y su realización es la densificación regional del marco global de referencia terrestre ITRF (International Terrestrial Reference Frame) en América Latina y El Caribe.

- ★ VLBI
- ◆ SLR
- DORIS



CONCLUSION and Future Perspectives

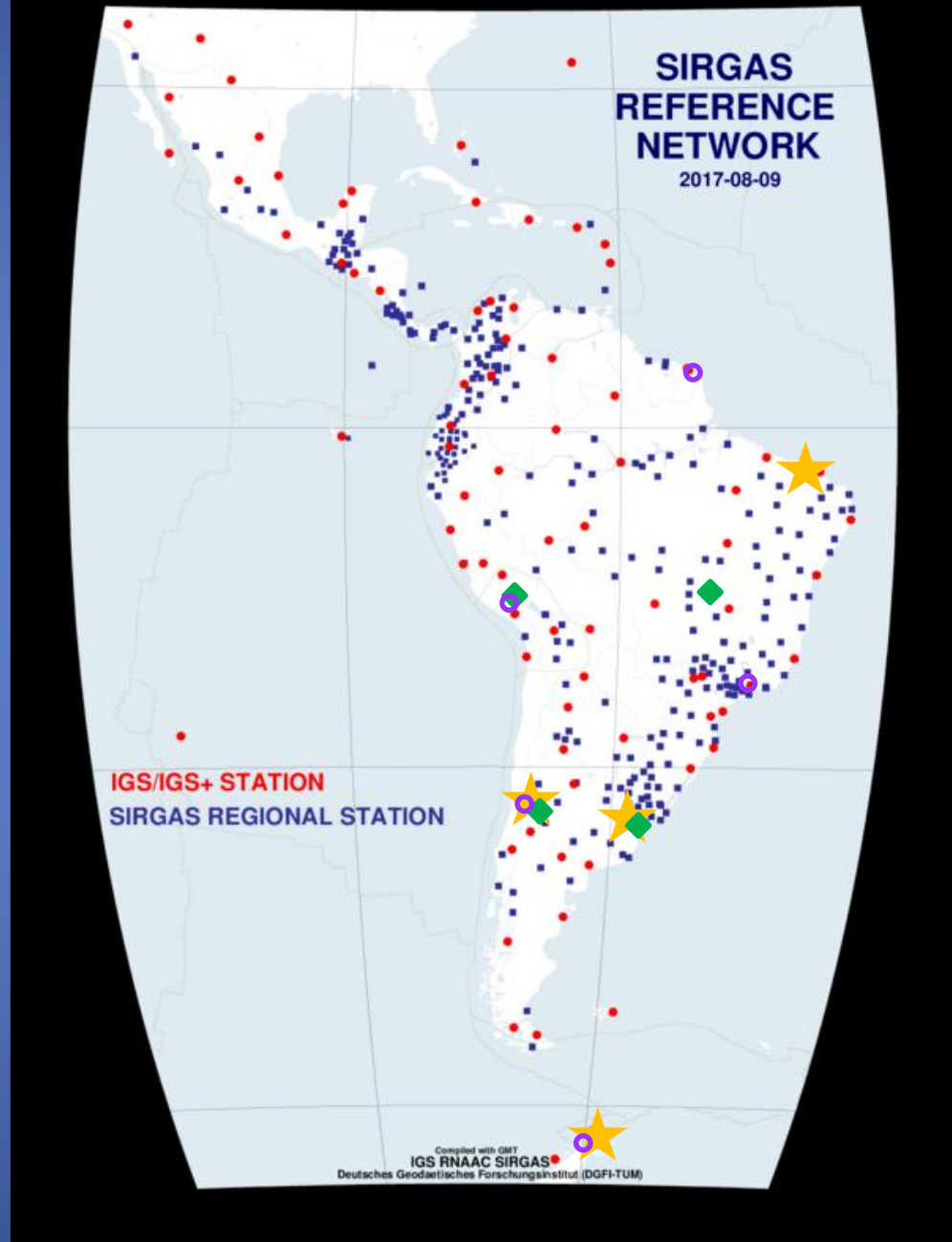
- The co-localization of the Kourou, Fortaleza, Arequipa, Brasilia, San Juan and La Plata stations is *essential* to improve the ITRF Realization, EOP Determination; accurate determination of orbits, especially on the **Southern Hemisphere**
- To include SLR – VLBI will improve ITRF and SIRGAS Realization, especially the orientation and scale
(ITRF origin: SLR – ITRF Scale: SLR with VLBI)
- It will allow a variety of studies related to the geodynamics and global change processes (motion of the pole, Earth rotation, plate tectonics, atmosphere features, ionosphere, etc.)

As a South American community, to make the necessary efforts to cover, with SLR or VLBI, the Northwestern gap of the continent.

Nowadays, SIRGAS is taking a big step into including other geodesic techniques of greater relevance (precision)



2° South American
SLR Workshop



Moreover this has been a successful experience in human relation because people of so different cultures had demonstrated they can work together with significant profit.



Thank you

