New Horizons for Latin American SLR Network

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ABSTRACT

Within the ILRS (International Laser Ranging Service) global network, continental subnets that carry out various scientific projects coexist.

In particular, in South America there are four SLR stations well located in the area; being the Arequipa Station in Perú the oldest one in the Southern hemisphere, code ILRS 7403 (set up in 1989). The ILRS 7407 Station in Brasilia is operational since 2014, and finally two stations in Argentina are operational as well, one of them, ILRS 7406 in San Juan (OAFA) and the other one ILRS 7408 in La Plata (AGGO), Buenos Aires, set up in 2006 and 2015, respectively.

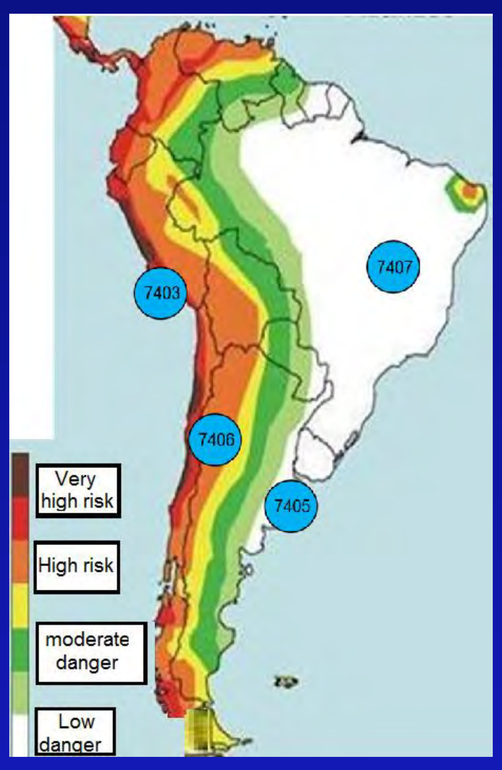
According to what was settled down at the Second Latin American SLR Workshop in November 2017, to work on common basis for the observation processing was decided in order to assimilate this system to the SIRGAS framework.

At this presentation the four SLR stations in the continent are shown at their present status and the challenges-to-come for this satellite technique in Latin America, taking into consideration future projects in the network.

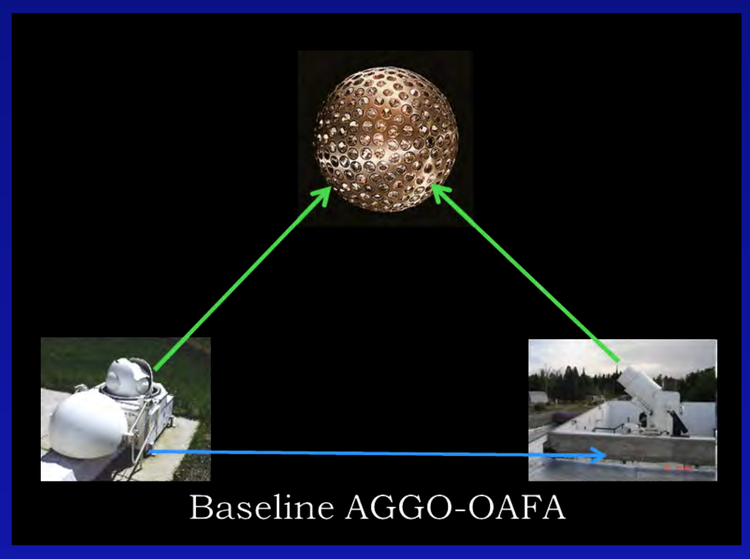
South American SLR network

Future Network Projects

1. Seismicity of the South American network



Seismic activity in the South American West is very high. Our SLR network can collaborate in this area, since has two stations to the West (Arequipa and San Juan) located in the zone of greater seismic activity of the continent, and on the other hand the two stations of the East (Brasilia and La Plata) are located in the area of least seismicity and can to use as "static" reference points for the evaluation of stations coordinates.



2. The Short-Arc Method

For analysis of seismicity and tectonic movements, the possibility of applying the Short Arc method to the SLR network is studied. This technique consists of the possibility of tracking the same satellite simultaneously from two (or more) SLR stations and process only the simultaneous data. Sinclair and Appleby showed that this technique has great potential for accuracy, especially for monitoring the baseline between participating stations (precision of 2-3 mm in the length of the base lines). Given the distances between the stations, this method could only be applied to the base OAFA - AGGO

Taking into account that these stations are included in the current international frames of reference ITRF 2014, the constant monitoring of their coordinates is absolutely crucial.

3. Future Center of SLR data processing.

In Argentina, the possibility of processing GNSS and SLR data with Bernese software is currently being studied, with the idea of including the OAFA, AGGO, Brasilia and Arequipa stations to the SIRGAS network.

SIRGAS is the Geocentric Reference System for the Americas. Its definition corresponds to the International Terrestrial Reference System (ITRS) and it is realized by a regional densification of the International Terrestrial Reference Frame (ITRF) in Latin America.

SIRGAS since its creation (1993) has worked only with the GNSS technique. The idea for the future is to include in SIRGAS definition, the other spatial geodesic techniques SLR, VLBI and DORIS, in the same way that the ITRF.

Objectives and Future perspectives of the South American SLR network

The first SLR Workshop in South America was held at the Félix Aguilar Astronomical Observatory in San Juan, Argentina 2009. In this meeting some of the objectives were:

a) Get to know the South American SLR stations (affiliations, personnel, equipment, functions, limitations, etc.)
b) Motivate the union and cooperation among the members for the making of joint works. Coordinate the important tasks for the network.
c) Promote the network development of our own investigations and publications
d) Promote the training and interchange of scientists, observers and students.
e) Have our own Data Processing Center, sharing software development, progress of each station, technical innovations, etc.

Many of these objectives have been achieved taking into account that researchers from the four SLR stations in the continent participated in November 2017 of the second SLR workshop organized within the framework of the SIRGAS meeting in Mendoza, Argentina. There, was agreed to continue the preparation in the SLR data process in a new workshop that will be offer by IERS Director Daniela Thaller, during November 2019 in Rio de Janeiro, Brazil.

Attendees to the Latin America SLR Workshop, Mendoza, Argentina, 30 November and 1 of December, 2017