

## **APPLICATION OF KINEMATIC GEODETIC REFERENCE SYSTEMS IN THE USE OF SIRGAS-CHILE NETWORK**

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The new Geodetic Reference System (GRS), SIRGAS in South America and its extension to Central and north America was implemented, where each country has adopted its own realization which are also consistent with ITRF95 and ITRF2000. In Chile SIRGAS is consistent with ITRF2000. The epoch was fixed on 2002,0 and was called SIRGAS-CHILE. Nevertheless the high precision of this GRF, are in the main two or three millimeters, there are one effect due to the dynamics of the plates called continental drift. The materialization of a GRS is done by the location of stations joined the above mentioned terrestrial crust. This stations move jointly with the crust. This effect is even major in the areas of deformation of the continent, since in Chile the subduction of the plate Nazca under the Continental (South America). This effect produces a variation of the geocentric position of the stations, that is to say, its coordinates are valid only for the epoch of the materialization of the GRS.

Nowadays, given the high precision that is possible to reach in the determination of the geocentric position with GNSS methods, it is possible to observe the kinematics of the tectonic plates and the deformation, also the movement of each station can be monitoring and models can be generated, which are useful for practical utilization of the SGR.

In most of the countries the number of the GNSS stations are increasing, like the GNSS SIRGAS – CON (see <http://www.sirgas.org>), and every country possesses his own net of permanent stations, which has allowed to obtain increasingly data to develop deformations models. In Chile two big projects are implemented that will include GNSS stations distributed in the whole territory, besides several international projects with stations for more than 10 years.

In this work we use information of a set of GNSS stations distributed in the south cone of South America and the velocity vectors are estimated to generate a model of deformations, which allows us the practical application of the new SGR SIRGAS-CHILE. Our results are compatible with the ones generated for ITRF, DGFI, and SIR RNAAC-SIR results that we will show in the presentation. The results are obtained in the Laboratory of Geodesy and Seismology (LGS) of Concepción's university, with Bernese 5.0 GPS software which is property of the geodetic observatory TIGO of Concepcion.

On the other hand, the geophysical models do not allow to obtain velocities valid for the deformation areas, which does more confused the application of these effects in the incorporation of new stations to the GRS.

Our results show the occurrence of several seismic effects on the stations, which deform the net in irregular way. In this point we will show what happens if not having considered these effects in the determination of positions.

The technical community does not have well known on how to apply these effects, we will be present different cases to apply the kinematics and which are the effects of not considering these aspects.