

Projects at TIGO

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Abstract

The Transportable Integrated Geodetic Observatory (TIGO) has been operational in Concepción, Chile for two years. Recently we began several projects which will have some impact on the VLBI data production and analysis.

1. PROGEO

With respect to making a better academic and research use of the Geodetic Observatory TIGO the project partner *Universidad de Concepción* (UdeC) launched a “*Programme on the Science of Geodynamics and Geospace*” (PROGEO) in which several faculties try to develop cooperative research activities. A positive side effect is also the intention to found the first study career for geodesy in Chile along with PROGEO.

As the observatory is producing data, young scientists and students will have to learn how to use this geodetic data. The knowledge about how to do it is available in the international services. We would like to receive support from the international community. PROGEO opens the door for scientists to come to Concepción for giving presentations on related subjects or making courses with postgraduate students.

Please contact the director of PROGEO, Oscar Cifuentes, if you are interested in doing science or education together with us. Mailto: oscar.cifuentes@tigo.cl

2. eVLBI

In the TIGO eVLBI project we are preparing ourselves for the eVLBI age. PhD student Sergio Sobarzo is analyzing the network infrastructures to get connected to the correlators. TIGO is fortunate to have optical fibres of the university reaching its site. We have to learn how to interface our data and how to send them to its destination on the fastest route *without* blocking the usual university network traffic. This induces a second priority scheme for eVLBI data, which requires probably its own protocols.

The Chilean university network REUNA is interested and supportive of the eVLBI theme. In May 2004 at the coming national event on broadband communication “eVLBI” will be a theme. In 2005 REUNA hopes to provide Gbit-services to the universities. The link to the US and Europe will be the bottleneck for broadband data communication. However the Internet2 and AMPATH

initiative in North-America and the European GEANT are looking to connect Latin America with more bandwidth to the northern hemisphere.

Some data transmissions via communication networks are planned for the near future in order to explore the possibilities and gain experiences in this subject.

3. Regional GPS Network

TIGO is located at the continental shelf of the South-American plate over a subduction zone. This requires careful interpretation of the geodynamical movements. We have to distinguish between continental, regional and local geodynamical movements. In order to do so, TIGO maintains a local survey network at the site, which also allows the determination of the space vectors between the IVS, ILRS, IGS reference markers. On the global level we are tied to other stations by the geodetic space methods and the measurements requested by the services. The gap of regional plate monitoring will be closed soon, when four GPS permanent receivers are being installed around TIGO at distances ranging from 15-50km at the sites Dichato, Faro Hualpen, Santa Juana and Quillón (fig. 1). The construction of the monuments is planned for March 2004.

Such a network at the coast of Chile permanently observed will allow also other research. The permanent stations can be used for weather forecast or determination of the water content in the lower atmosphere as well as a monitor device for ionospheric conditions which complement VLBI. The ionospheric research will be further complemented by Japanese-Chilean experiment with dedicated ionospheric antennas, of which one will be co-located at the TIGO observatory.

4. Vertical Datum

For the definition of a vertical datum a tide gauge will be installed at Dichato (a nice fishermen village) co-located with one of the four GPS receivers of the TIGO regional network (fig. 1). With permanent GPS observations between the tidegauge GPS monolith and the IGS site at TIGO the sealevel can be referred to TIGO (and its superconducting gravity meter).

5. Antenna Controller for Radiotelescope

We expect the installation of a new Antenna Control Unit for the TIGO radiotelescope in September/October 2004. This is a requirement because some spare parts are not available any more. With the upgrade we hope to extend the lifetime of TIGO by 10 years.

The interfacing to the Field System Software for VLBI operations requires some software programming.

6. Visitor Center

TIGO as an observatory is an attraction for students of university and schools of the region as well as for visiting professors at the university. A visitor center (which by its architecture also serves as a solar clock in contrast to TIGO's atomic clocks) was designed containing an auditorium for 120 persons and a hall for permanent interactive exhibitions. The concept allows us to perform star shows at night in the visitor center with an additional astronomical telescope. However the realization is still outstanding.

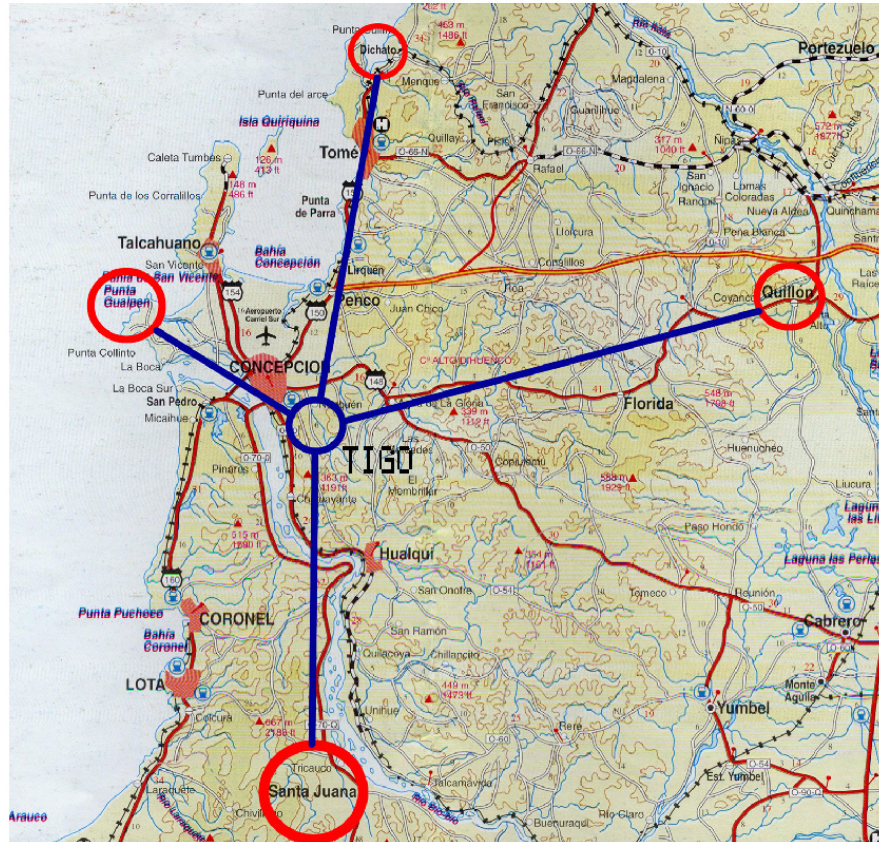


Figure 1. Map showing the locations of four intended sites for permanent GPS observations around TIGO. The upper point *Dichato* will co-locate the TIGO tide gauge. The baselines range from 15 to 50 km.

We are still looking for the funds and the telescope donation for this educational project in this developing country. Therefore the authors would like to invite the reader to support our idea and helping us in realizing this idea.