

New Chilean Reference Frame: Three Years After the Maule Earthquake

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SUMMARY

The particular geographical situation of Chile has transformed the country into a very seismic region. Chile is located just above the subduction zone between the Nazca and the South American plate. In this zone the Nazca plate moves underneath the South American plate causing a drift of 2 cm/year in the north east direction. This physical phenomenon is the responsible for all the seismic, geological and volcanic activity that characterizes the region. Chilean reference frame is based on the GNSS technology. A total of 66 continuous GPS stations programmed to record data every 30 seconds, for 24 hours a day and distributed all over the country has form the skeleton of the horizontal network that provide the frame on which all the national geospatial infrastructure is develop. The February 27 2010 Maule mega thrust earthquake involved surface displacement that range for 0.3 to 5 mt in the horizontal coordinates, meaning the total destruction of the quality of the reference frame both active and landmarks. The analysis of all the information gathered during this 3 years period has provided a clear picture of the deformation during the earthquake and specially the deformation produced after the event. From the information and analysis of the data gathered during this period, it was possible to develop an approach to measure, process and rebuilt the national reference frame. This work has contributed to the national territorial develop through the use of an standardize modern and global geodetic reference frame.