



## **A post-seismic deformation model after the 2010 earthquakes in Latin America**

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The Maule 2010 earthquake in Chile generated the largest displacements of geodetic observation stations ever observed in terrestrial reference systems. Coordinate changes came up to 4 meters, and deformations were measurable in distances up to more than 1000 km from the epicentre. The station velocities in the regions adjacent to the epicentre changed dramatically after the seism; while they were oriented eastward with approximately 2 cm/year before the event, they are now directed westward with about 1 cm/year. The 2010 Baja California earthquake in Mexico produced displacements in the decimetre level also followed by anomalous velocity changes. The main problem in geodetic applications is that there is no reliable reference system to be used practically in the region. For geophysical applications we have to redefine the tectonic structure in South America. The area south of 35° S ... 40° S was considered as a stable part of the South American plate. Now we see that there are large and extended crustal deformations. The paper presents a new multi-year velocity model computed from the Geocentric Reference System of the Americas (SIRGAS) including only the four years after the seismic events (mid-2010 ... mid-2014). These velocities are used to derive a continuous deformation model of the entire Latin American region from Mexico to Tierra de Fuego. The model is compared with the same velocity model for SIRGAS (VEMOS2009) before the earthquakes.