

SIRGAS and the earthquake of November 7, 2012 in Guatemala

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On November 7, 2012, at 16:35:46 UTC (10:35:46 local time) a strong earthquake (magnitude 7.4) shook the area located at the southern part of Guatemala, close to the city Champerico. The epicentre was estimated at 13.977°N and 91.876°W in a depth of about 24 km. Unfortunately, this seism caused the death of almost 50 persons, some tens injured, and an extensive damage in the country. SIRGAS deeply complains this loss of life and express its solidarity with the Guatemalan people.

To estimate the impact of this earthquake in the SIRGAS Reference Frame, daily station positions between November 4 and 10, 2012 were computed for selected continuously operating SIRGAS stations, including all the operative stations of the Guatemalan Geodetic Reference Network. This processing includes IGS Reference Stations located in North America, the Caribbean, Asia/Oceania and South America as fiducial points. The comparison of pre-seismic and post-seismic station positions shows the largest displacement (4,3 cm in S-W direction) at the station COAT (Coatepeque) and the second largest movement (1,7 cm in S-W direction) at station HUEH (Huehuetenango). Movements larger than 6 mm were also detected at the stations BARI (Huehuetenango), CHIQ (Chicaman), GUAT (Guatemala City) and COTZ (Santa Lucia Cotzumalguapa). The vertical changes estimated after this processing are at the same order of the station position accuracy, and therefore, they are considered negligible. However, these results will be refined when the SIRGAS Analysis Centres process the corresponding week within the routinely computation of the continental reference frame and the post-seism station position time series are available.



Horizontal displacements of the SIRGAS Reference Frame estimated after the earthquake 7.4M of 2012-11-07 in Guatemala

These computations were carried out by the SIRGAS Analysis Centre at DGFI (Deutsches Geodätisches Forschungsinstitut) and are based on the observation data provided by the Instituto Geográfico Nacional (IGN) of Guatemala, the Instituto Nacional de Estadística y Geografía (INEGI) of Mexico, the Instituto Geográfico Agustín Codazzi (IGAC) of Colombia, the Dirección General de Catastro y Geografía (DGCG) of Honduras, and the IGS (International GNSS Service, www.igs.org). We deeply acknowledge this support.