

Seismogeodetic Network in Southern Mexico to Monitor Crustal Deformation in Real Time

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A network of 20 seismogeodetic instruments was installed in the subduction zone of Mexico. The purpose of the data is to monitor the crustal deformation of the subduction zone, to estimate the magnitude of great earthquakes, and to contribute to the tsunami warning system of Mexico operated by the Mexican Navy. Information generated by the network is transmitted in real time by dedicated satellite antennas in L Band. The network is composed of instruments combining accelerometers and GNSS receivers. The strong motion data is sampled at 200 Hz. The GNSS data is processed in real time using RTX corrections and a recursive Kalman filter that uses the strong motion data to correct the real time GNSS data. The geodetic data is sampled at 2 Hz. The results show daily averages of ground displacement data comparable to post-processed data that includes orbital and atmospheric corrections. An algorithm was developed to estimate magnitude based on the post-seismic deformation of the coast. The data is monitored continuously, and the length of the fault is estimated based on the extent of the crustal deformation. The magnitude is estimated based on the fault area. Tsunami warnings would be based on the measured co-seismic deformation.

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Promotional text

This innovative observational network combines seismic and high quality GNSS data in real time to continuously monitor this active subduction zone. It has the capacity to estimate the magnitude of great earthquakes in real time and to provide data for tsunami warning purposes.

Oral preference format

in-person

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