[EJ] Evening Poster | S (Solid Earth Sciences) | S-SS Seismology

[S-SS09]Crustal Deformation

convener:Tadafumi Ochi(Institute of Earthquake and Volcano Geology, Geological Survey of Japan, The National Institute of Advanced Industrial Science and Technology), Mako Ohzono(Institute of Seismology and Volcanology, Graduate School of Science, Hokkaido University)

Sun. May 20, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

Study of crustal deformation plays an extremely important role in the investigation of wide scale earth dynamics those are earthquake and volcanic activity, plate motion and so on. In our session, we discuss the study related to crustal deformation, such as development of observation instrument, observed crustal deformation, analysis method, and simulation study.

[SSS09-P16]Coseismic deformation of the 25 October 2010 Mentawai Earthquake Mw 7.8 revealed by ALOS PALSAR images

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Keywords:The 25 October 2010 Mentawai Earthquake, Coseismic deformation, ALOS PALSAR, GPS

The Mentawai earthquake with magnitude Mw 7.8 occurred on 25 October in the around of Sumatra subduction zone, Indonesia at 21:42 local time. This earthquake is one of the very shallow earthquakes but with a large magnitude that can generate measurable deformation. Large deformation generated from this earthquake can be known through Global positioning system (GPS) data. The GPS displacements time series are <22 cm horizontal and <4 cm subsidence (Hill *et al*. 2012). We aim to complement the GPS data by using ALOS PALSAR images because the spatial coverage of GPS data is not good enough to infer the source processes. Here, we used four the descending orbit L-band Synthetic Aperture Radar (SAR) images acquired by the Advanced Land Observing Satellites (ALOS) Phased Array L-band Synthetic Aperture Radar (PALSAR) data to estimate the earth surface displacements associated with this earthquake, based on shoreline changes in the PALSAR intensity images. We processed the raw SAR data from a level-1.0 product using a software package, GAMMA (Wegm¨uler and Werner, 1997). Based on the intensity image before and after the earthquake, we reported that in general the intensity of the image before the earthquake was greater than after the earthquake around the shoreline. This indicates that there has been a shrinkage in the region which means there is ground subsidence around the shoreline although the changes shown are not significant or small displacement and where this region has been observed by GPS data before. The measured vertical displacement with GPS data is 4 cm subsidence. Therefore, from here we can understand that there is a suitability between our measurement data and GPS data where ground displacement occur in the southern Pagai region.