
 [JJ] Evening Poster | S (Solid Earth Sciences) | S-CG Complex & General

[S-CG67] Ocean area observation to detect crustal activity under the seafloor: Present and future

convener: Kazuro Hirahara (Department of Geophysics, Earth and Planetary Sciences, Graduate School of Sciences, Kyoto University), Ryota Hino (Graduate School of Science, Tohoku University), Takane Hori (独立行政法人海洋研究開発機構・地震津波海域観測研究開発センター)

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Recent progress of seafloor observations for earthquake and crustal deformation, such as deployment of submarine cable networks of S-net and DONET, and repeated observations of GNSS/A and acoustic extensometer (direct path acoustic ranging), enable us to evaluate on-going crustal activities in the megathrust regions along the Japan trench and the Nankai trough. We review the present status and the future plans of such seafloor observations, and discuss the future directions of seafloor observation networks, especially for real-time monitoring of crustal activities. Toward these directions, we welcome papers introducing the present status of novel approaches and systems such as optical fiber, laser ranging or seafloor SAR and real-time geodetic observations using mooring buoys or wave glider, and so on. We also welcome future plans to integrate observation for the crustal activity under the seafloor with observation for ocean and climate changes.

[SCG67-P05] Detection of postseismic slip after the 2011 Tohoku Earthquake by means of direct path acoustic ranging (DPR)

*Ryusuke Yamamoto¹, Ryota Hino¹, Motoyuki Kido², Yukihiro Osada^{1,3}, Chie Honsho¹, Syuichi Suzuki¹
(1. Graduate School of Science, Tohoku University, 2. International Research Institute of Disaster Science, Tohoku University, 3. GNSS Technologies, Inc.)

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The 2011 Tohoku Earthquake caused massive, over ~ 50m, coseismic slip, especially the off-Miyagi region. After the earthquake, large postseismic deformation was detected by GPS-Acoustic (GPS-A) observations and the deformation in the large coseismic slip area was significantly affected by the viscoelastic relaxation after the coseismic deformation. Therefore, it is difficult to identify the contribution of the shallow postseismic slip (after slip) in the seafloor deformation data. In this study, we try to detect the shallow postseismic slip by using direct path acoustic ranging (DPR).

DPR periodically measures two-way travel times between a pair of two stations. We can obtain precise range by calculating the product of travel time and the sound velocity in seawater. The sound velocity in seawater is estimated from temperature, pressure and salinity, so we also measure temperature and pressure. In this presentation, we show the result of two site of observations: the off-Miyagi and the off-Fukushima. The observations at the off-Miyagi were executed three times (2013, 2014-2015, 2015-2016), and at the off-Fukushima is now in progress (2017-). In the off-Miyagi region, no significant shortenings were detected in all the observation periods, from 2013 to 2016.

The results from series of the off-Miyagi observations suggest that shallow postseismic slip did not occurred at least in the period from 2013 to 2016 in the region where the massive coseismic slip had occurred. In off-Fukushima region, we collected the measurement data for about seven months, from March 2017 to October 2017, by an acoustic data transmission. Preliminary analysis to the obtained data

suggests noticeable shortening of the baselines across the trench axis in the off-Fukushima, as opposed to the results in the off-Miyagi. The difference in the DPR results made in the two sites along the Japan Trench may represent the spatial heterogeneity of postseismic slip in the shallow portion of the plate boundary near the Japan Trench after the 2011 Tohoku Earthquake.

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