

## Progress of borehole seismo-geodetic observation above the rupture zone of the Tonankai earthquakes.

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Sensitive seismic and geodetic sensors were installed in seafloor boreholes drilled near the rupture zone of the Tonankai earthquakes to construct high-quality seismo-geodetic observatories in the seafloor. Three or more borehole observatories are planned in the area and these observatories are planned to connect to dense ocean floor network for earthquakes and tsunamis (DONET) for realtime long-term seismo-geodetic observation in the rupture zone of the Tonankai earthquakes and off-shore side of the zone. The construction of the borehole observatories began in 2009 at IODP C10 site where we installed temporal pore-fluid pressure sensor. In December, 2010, we installed the first permanent seafloor borehole observatory in the area in IODP C2 site with borehole sensors such as volumetric strainmeter, tiltmeter, broadband and strong motion seismic sensors, pore-fluid pressure sensors, and thermometers. It was necessary to check performance of the installed borehole sensors in the C2 observatory before starting long-term observation. Originally an ROV cruise was planned in March, 2011, which was cancelled due to the earthquake in March 11, 2011. With some delay, we were still able to check the performance of all the borehole sensors through ROV visits in JAMSTEC R/V Natsushima cruises NT11-09 in July 2011 and NT12E01 in January 2012. All sensors were checked and these performed well in the seafloor borehole. The data from the borehole broadband seismometer in the C2 observatory showed the borehole is 10-20 dB quieter in some of seismic frequencies, suggesting good observation environment for seismo-geodetic observation is established in the borehole. Pore-fluid pressure sensors in the C2 observatory were checked at the time of installation and continued continuous observation since the installation. We have not still started continuous observation with other sensors but we plan to start long-term observation in near future and we are also preparing connection of the C2 observatory to the DONET cable in January 2013.

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