

## Triggered low frequency tremors in Tonankai accretionary prism, by the 2011 Tohoku-Oki earthquake

TO, Akiko<sup>1\*</sup>, OBANA, Koichiro<sup>1</sup>, TAKAHASHI, Narumi<sup>1</sup>, FUKAO, Yoshio<sup>1</sup>

<sup>1</sup>Japan Agency for Marine-Earth Science & Technology

There have been many reports of triggered tremors and micro-earthquakes, by the 2011 Tohoku-Oki earthquake, most of which are based on land observations. Here, we report that numerous low frequency tremors are recorded by broadband ocean-bottom seismographs of DONET, a network of cabled observatory systems deployed in the Tonankai accretionary prism of the Nankai trough. Ten stations were in operation at the time of the earthquake. The tremors are observed at five of the stations, which are located on the landward slope of the Nankai trough. On the other hand, the signals are weak at stations near the coast, which are placed on the Kumano Forarc basin.

The tremors are dominant in a frequency range of 1-10Hz. Their duration ranges from tens of seconds to a few minutes. More than 20 events per hour can be detected in the first few days after the earthquake. The activity continues about one month with a decrease in the frequency of occurrence.

An intriguing feature of the observed tremors is that some of them are associated with a very low frequency (VLF) component, most clearly visible between 0.02 and 0.05 Hz. We found 74 such events within 5 days after the great earthquake. The VLF signals of the 72 events are observed at stations located above the shallowest part of the splay fault, and the remaining at a station above the up-dip toe of the main thrust. The instrument-corrected seafloor displacement corresponds to a subsidence of up to 0.04 mm with a rise time of 10-20 s. For each event, the VLF signal is detected only at one station in contrast to the high frequency signal (1-10Hz), which can be observed at more than a few stations. The disappearance of the large VLF signal at neighboring stations located only ~20km away indicates that the station which recorded this signal is well within the near field of the source.

In the presentation, we discuss the spacial and temporal variation of the triggered low frequency tremors during one month after the great earthquake.

Keywords: low frequency tremor, Ocean bottom seismometer, 2011 Tohoku-Oki earthquake