

SCG058-P03

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Non-volcanic low frequency tremors only detected by vertical seismic array network (V-net)

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In 2007, Geological Survey of Japan, AIST has started an integrated borehole observation in southwest Japan for forecasting the anticipated Tokai, Tonankai and Nankai megathrust earthquakes. Each observatory has three boreholes with different depths (about 30 m, 200 m and 600 m), in which we installed high-sensitivity seismometers at the bottom of every borehole. On the basis of a semblance analysis using this vertical seismic array network (V-net) data, we developed a monitoring system of the Non-volcanic low frequency tremors (LFTs) and showed a dramatic improvement of the LFTs detection (Takeda et al., 2010). In this study, we report the LFTs activities that were only detected by using the V-net seismograms and investigate their features.

The LFTs activities generally last for days to week in southwest Japan and occur repeatedly with a recurrence interval for three to six months (e.g. Obara 2010). These LFTs activities are easily recognized with an envelope correlation method (ECM) or on an earthquake catalogue reported by Japan Meteorological Agency (JMA). We call these activities "a major episode". In this study, we found many other LFTs activities that were detected by a semblance analysis using the V-net seismograms (vertical seismic array detection method; VSAD) during the V-net observation over the last two and a half years. Durations of these activities had almost equivalent to those of major episodes, and some of them lasted over one week. It should be noted that most of these activities could not be detected by ECM and were not listed in the JMA catalogue. It means that seismic radiation energies of these activities are extremely smaller than those of major episodes.

It is difficult to determine the LFTs location by using the VSAD method. However, some of these activities were simultaneously detected by multi-observatories, and then we could roughly estimate their locations. Our result suggests that some of these LFTs episodes occur in a gap region of LFTs activity.

References:

Obara K. (2010), Phenomenology of deep slow earthquake family in southwest Japan: Spatiotemporal characteristics and segmentation. *J. Geophys. Res.*, vol. 115, B00A25.

Takeda N., K. Imanishi, and N. Koizumi (2010), Precise Monitoring of Non-volcanic Low-frequency Tremors using Vertical Seismic Array: The case of Tokai Area, Southwest Japan. 2010 AGU fall meeting.

Keywords: Non-volcanic low frequency tremors, vertical seismic array, semblance analysis, V-net, VSAD