

Centroid moment tensor analysis of very low-frequency earthquakes near the Nankai trough

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The Nankai trough subduction zone in southwest Japan is characterized by some kinds of slow earthquakes. Around the deep side of the seismogenic zone on the subducting Philippine Sea plate, non-volcanic tremor is distributed in a narrow belt along the strike of the plate (Obara, 2002). On the other hand, on shallower parts of the seismogenic zone, an anomalous seismic activity has been detected. The waveform of the earthquake is characterized by a band-limited low-frequency content of between 10 and 20 seconds. We call the earthquake very low-frequency (VLF) earthquake. In order to reveal the hypocenters and focal mechanisms of VLF earthquakes in detail, we estimate the CMT solution of VLF earthquakes.

Broadband seismometers (STS-1/2) and high-sensitivity (tiltmeter) are installed at NIED F-net and Hi-net stations, respectively. The seismogram in NIED F-net and Hi-net stations are used for the CMT analysis. Centroid hypocenter and time are estimated by grid-search: grid intervals are 1 km in space and 1 second in time.

There was active cluster of the VLF event near the Hyuga-nada region in 2003. Their CMT solutions with the reverse fault type mechanism and 2-10 km in depth are estimated. Their centroid epicenters are distributed land ward from the trench axis with 70 - 80 km width. These results suggest that the VLF earthquakes might occur in the accretionary prism or on the decollement.