

Precise observation of migration of non-volcanic low frequency tremors by using dense seismic array

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Non-volcanic low frequency tremors (NVTs) in several major plate boundaries migrate with wide velocity range from 10 km/d to over 50 km/h. The NVTs migrations are characterized by the velocity and direction. The fastest NVTs migration of the velocity over 50 km/h is in either updip or downdip direction parallel to the slip direction of subducting plates [e.g. Ghosh et al., G3, 2010; Ide, JGR, 2012]. Since March 2011, Geological Survey of Japan, AIST, performed the observation by a dense seismic array in Mie prefecture. In this area, the active NVTs occur at intervals from 3 months to 6 months. Then, the seismic array records of over 10 times of major NVTs events were obtained to date. In this presentation, we located NVTs hypocenters by an analyzing procedure same to the method of Ghosh et al. [G3, 2010] using our dense seismic array.

A sensitivity of the NVTs detection by using the seismic array is higher than a conventional envelope cross-correlation method. However, the detection capability decreases, when the NVTs occurs roundly, as same as the case of the envelope cross-correlation method [Takeda et al., JpGU, 2014]. Furthermore, the location accuracy is influenced by a distance and a velocity structure between the NVTs hypocenter and the array.

Our observation infers that all the fastest NVTs migration around the array (within 25 km of epicentral distance) is in the almost same direction during these three and half years. The migration direction is almost parallel to the slip of the subducting plate, while some of events migrate in different directions. Furthermore, in some case, the direction changed temporary in the same event.

To confirm a relation between these differences of migration directions and the detailed location of NVTs is future work.

Keywords: non-volcanic low frequency tremor, seismic array, Kii Peninsula