

# Fast migration of low-frequency tremor source

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Low-frequency tremors occurred in the east Shikoku region from 13 to 17 December 2003 following a relatively large earthquake with a magnitude of 4.6 (JMA) in the Harimanada region. From an analysis of continuous short-period seismic records of these tremors we obtained cross-correlation diagrams, which clearly show time variations of cross-correlation values for pairs of stations. We searched for systematic time variations of the time lag corresponding to the maximum cross-correlation since such time variations possibly represent migrations of tremor source.

We found a systematic time variation in the time lag at the last stage of the tremor activity. Under the assumption of linear migrating source with a constant velocity, we inverted locations of the end points of the line source from the time lag data. The result shows that the variations can be explained by a fast migration with a speed of about 41 km/hour. This is an extremely high speed compared to the previous value of the order of ten km/day. The source depth was about 29 km at both the ends. Such a high-speed migration might be explained by a fast cascading sequence of shear failures and/or hydrofractures due to aqueous fluid.