

## Deep Low-frequency Events Associated with the Inland Active Faults in Southwest Japan

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In previous studies, deep low-frequency (DLF) earthquakes have been discussed in association with fluid (magma) activity around volcanoes. There are several examples of DLF activity beneath active faults in southwest Japan without volcanic activities in the vicinity.

In the focal region of the 2000 Western Tottori Earthquake (Mw6.8), several DLF earthquakes were observed prior to the earthquake and the DLF activity increased after the mainshock. The events are located at 25 - 35 km depth in the focal region with a magnitude range up to 1.8. A DLF earthquake that occurred 9 hours before the mainshock was detected and analyzed by Ohmi & Obara (2002). They concluded that the single-force source mechanism is more preferable than the ordinary double-couple source mechanism, that indicates the transport of fluid beneath the source region of the Mw6.8 earthquake.

There are several other examples of DLF's that are associated with active faults in southwest Japan. They are Mitoke fault system in Kyoto, Takashozu fault in Toyama, northeastern part of Atotsugawa fault system, and along the axis of the Hida mountain range between Tateyama and Shirouma-Norikura volcanoes. Other than these areas, JMA catalogue indicates the existence of DLF earthquakes at Arima-Takatsuki Tectonic line, Osaka-bay fault system, and off Fukui prefecture.

Seismic tomography analysis (e.g. Zhao et al., 2000) indicates the existence of a low-velocity body at depths from the lower-crust to the upper-mantle in the focal region of these DLF's. The distribution of DLF activities, described above, corresponds well to the low-velocity region rather than to the distribution of volcanoes. The DLF occurrences are probably direct evidence of fluid activity in the seismogenic zone, which might be injected from the lower-crust beneath active faults.

In southwest Japan, the Philippine Sea Plate(PHS) is subducting beneath the Japan Island Arc at a low angle. The PHS is a young plate and thus the dehydration process would be active. It possibly affect the injection of the fluid to the lower-crust of the region.