

Activity of Deep Low-Frequency Earthquakes in the Western Tottori Region

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On October 6, 2000, a $M_w6.7$ crustal earthquake occurred in western Tottori prefecture, southwest Japan. Beneath the focal region of the earthquake, DLF earthquakes were observed at depths of around 30 km. Five DLF earthquakes were detected during the 3 years before the mainshock and one occurred 9 hours before the mainshock. The focal mechanism of the DLF earthquake that occurred 9 hours before the mainshock was analyzed by using amplitude ratios of the S-waves to the P-waves and polarization patterns of the S-waves (Ohmi & Obara, 2002). The result indicated that a single-force source mechanism is more preferable than a double-couple source mechanism, which suggests the transport of fluid, such as water or magma. More than 100 DLF earthquakes, most with magnitudes up to about $M1.5$, were observed during the 2 years after the mainshock. There are a few larger DLF earthquakes, whose magnitudes are greater than 2.0, that have source time durations considerably longer than those expected from scaling relations between source dimension and seismic moment for normal earthquakes. This indicates that the source mechanisms of these DLF events are quite different from that of ordinary tectonic earthquakes.