

## Imaging of the fault zone of 2000 Western Tottori earthquake with M7.3 by coda envelope inversions

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Seismic coda which arrives after direct waves is considered as a superposition of incoherent scattered waves caused by inhomogeneous structures of the Earth. Therefore it is expected that envelope inversion methods is one of effective methods to image inhomogeneous structures of fault zones. We applied an envelope inversion method newly developed [Asano and Hasegawa, 2002] to data obtained by the Joint Group of Dense Aftershock Observation in and around the focal area of 2000 Western Tottori earthquake with M7.3. We could estimate 3-D spatial distribution of scattering coefficients with a high resolution. The method is based on single scattering theory taking into account of double-couple source radiation, 1-D depth dependent velocity structure, and scattering absorption. We used 3567 envelopes composed from three-component velocity seismograms as data for our inversion. The result of the inversion shows there exist several zones with large scattering coefficients (LSZs). One of those predominant LSZs is distributed along and around the fault zone of the M7.3 earthquake in the upper crust. The LSZ distributed along the fault plane suggests the existence of damaged zones in the main shock fault. In this LSZ, an exceptionally small scattering coefficient zone (SSZ) was detected. This SSZ spatially corresponds to an asperity with large slip amount [Sekiguchi and Iwata (2001)]. LSZs are also detected in the mid to lower crust. A predominant LSZ is distributed beneath the northwestern part of the mainshock fault. The LSZs are also located in a seismic low velocity zone [Mayeda and Shibutani, 2001] and near Quaternary volcanoes. The LSZs presently imaged are probably related to the existence of fluids. These also suggest that the method is useful to detect unknown faults without predominant fault displacement on the ground surface.