Distribution of Q values beneath the source region of western Tottoriearthquake derived from attenuation tomography

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Q values which present the magnitude of attenuation are varied with the property of rock materials or status of rocks as well as seismic velocities. Then to know a detailed distribution of Q values will give us new information about the status of crust. Western Tottori earthquake occurred on 6, October 2000 at the inland area where no active fault was detected. In this study, we carried out a temporary seismic observation around the source region, and made an attenuation tomography analysis using the observed data.

From 7 February 2001 to 7 April 2002, a dense seismic network was operated by CRIEPI and Tokyo Metropolitan University and Chiba University around the source area of western Tottori earthquake. Station spacing is about 3km and total number of seismic station is 44. We use the DAT recorder or telemetry system for continuous recording of seismic data. Seismic events were cut out from collected data referring the hypocenter list determined by NIED[Aoyagi et al.(2001)]. From these waveforms, we pick the P and S arrivals and determined hypocenters again. Polarities of the P arrivals are also checked

and source mechanisms are determined from these polarity data. From all data whose hypocenter and mechanism solutions were determined, we selected 111 events and calculated P spectra data for attenuation inversion. The combined inversion in which source, site and propagation effect are solved simultaneously [Tsumura et al,(2000)] are applied the spectra data to obtain the Q structure. To express the 3-dimensional Q structure, we divided the study area into many blocks with the size 5km x 5km x 2.5km and assumed the Q value is constant in each block.

In first and second layers (shallower than 5km), estimated Q value are quit low and in some blocks, lower than 50.The blocks which are located in the northern area have lower Q than those of southern area. This tendency

probably reflects the geologic difference between the northern and southern area. In the third layer (depth 5-7.5km), we can see the lower Q on the eastern region of source region than that of the western area. However it might be apparent tendency because the block size for inversion was too big and the Q effect was averaged in the wider area than actual one.