

Heterogeneous Crustal Structure in the Fault Area of the 2000 Tottori-ken Seibu Earthquake by Multi-channel Observations (2)

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On October 6, 2000, an earthquake (Mw 6.6) occurred in the western Tottori prefecture of Japan. Although the earthquake is a large intra-island-arc type event, a surface rupture is not clearly observed. The generation mechanism of such intra-island-arc earthquakes is not clarified yet. The heterogeneous crustal structure is one of the key points to understand these earthquakes.

To reveal the heterogeneous crustal structure in the fault area of this earthquake, we conducted multi-channel earthquake observations as a part of a joint aftershock observation. We deployed a 12-km-long highly dense multi-channel seismic array (MCS array) along and across the main fault area. We operated the array for 85 hours from 17:00 on Oct. 21 (JST) to obtain quasi-continuous records of aftershocks. At the same time, about 700 events were located by off-line recorders operated by the joint aftershock observation (Chiba et al., 2001). About 300 events among them were recorded in our MCS array.

Since the seismic sources are not on the surface of the earth, we cannot apply the conventional CMP method to this earthquake data set. Therefore, we applied the VSP (Vertical Seismic Profiling) method. We used 1-D velocity model that is used in the joint aftershock observation. We assumed the SS reflection. We can recognize strong reflected waves from the mid-crust at depths of 10 km, 12 km, 18 km, and 32 km.

We found that the errors of epicenters or origin times of aftershocks introduced noises in reflection layers.