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Crustal Heterogeneity in the Source Region of the 2004 Mid Niigata Prefecture Earthquake (*M*6.8)

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The 2004 Mid Niigata Prefecture Earthquake (M_{JMA}6.8) and its aftershock sequences generated complicated, i.e., several conjugate fault planes in their source region. In order to understand the occurrence process of these earthquakes, we estimated the crustal heterogeneity by inversion of coda envelopes of aftershocks, and also analyzed fault-zone trapped waves using seismograms recorded on the Obiro fault, where coseismic flexure deformation was detected. In the coda analysis, the deviation of coda envelopes from average decay curve was measured as the observational data and inverted to estimate 3D distribution of relative scattering coefficient. We analyzed 138 seismograms from 30 events, recorded at 7 stations. The result shows strong scattering in the source region at depths from 0 to ~20 km (Figs. 1 and 2). We will discuss the detailed heterogeneity related to the earthquake generation after adding more data to increase the resolution. In the analysis of fault-zone trapped waves, we used event-array method. This method has an advantage of reducing the site effect and we detected possible trapped waves by rotating the linear alignment of events, parallel and perpendicular to the fault strike. We will estimate the fault-zone structure by modeling the trapped waves, and also discuss the relationship between the Obiro fault and the buried earthquake source fault.

Keywords: Mid Niigata Pref. Eq.; heterogeneity; coda; scattering; trapped wave.

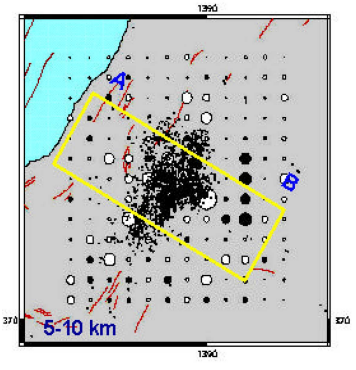

Figure 1. Distribution of relative scattering strength (◯) at depth of 5-10 km. Dots show aftershocks.

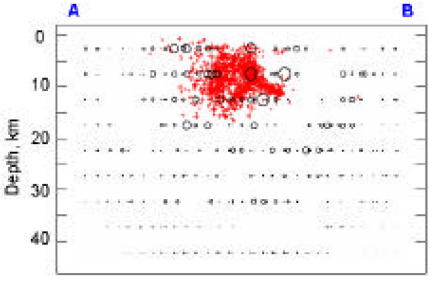

Figure 2. Cross section showing scattering strength (◯) and aftershocks (red dots) for the rectangular area shown in Fig.1.