

Deep Seismic Crustal Structure at the Tokai-Chubu Region

Takashi Iidaka[1], Tetsuya Takeda[2], Takaya Iwasaki[3], Eiji Kurashimo[1], Tomonori Kawamura[4], Takeo Moriya[5], Fumihito Yamazaki[6], Katuhiko Koike[7], Gen Aoki[8]

[1] ERI, Univ. of Tokyo, [2] ERI, Univ. Tokyo, [3] ERI, Tokyo Univ., [4] ERI, [5] Earth and Planetary Sci., Hokkaido Univ., [6] Res. Ctr. Seismol. & Volcanol., Nagoya Univ., [7] Earth and Environmental Sci, Nagoya Univ, [8] MRI

Introduction

The Philippine Sea plate is descending into the mantle beneath the Honshu with a velocity of several cm/year. Tokai region is one of the interesting regions to know the mechanism of large earthquakes because many large earthquakes have occurred along the Nankai-Suruga troughs. Numerical simulation studies have been done in this region. In the simulation studies, the configuration of the subducting plate is very important parameter. The configuration of the subducting slabs has been estimated by the use of seismicity maps. Seismicity map is not suitable to know the fine structure of the subducting slab. We have done a seismic experiment with explosions to know the configuration of the subducting Philippine Sea slab and crustal structure of the central Japan region.

Data

We use seismic records of 6 shot points. Those shots are located from Shizuoka to Ishikawa prefectures with spacing of about 20-50 km. Total length of the seismic survey line is about 262 km. We put 391 seismic stations on the survey line.

Results

The large lateral change of the upper crustal structure is not found. The sediment layer is located below the surface with the thickness of 1-2 km. The velocity of the second layer is about 5.0-5.5km/s with thickness of about less than 5 km. The third layer located below the second layer with the velocity and thickness of 5.8-6.1km/s and 5-15km, respectively. Beneath the third layer, a layer with the velocity of about 6.3-6.5km/s are located.

Several interesting features are found on the record sections. The record section of the shot-J1 suggests the thick sedimental layer is located beneath the Tonami plain. At the record section of shot-J5, clear later arrivals are observed. One of the later arrivals are observed on the survey lines with a distance of 150km. The latter arrivals can be explained by the reflected wave at a boundary with a dip angle of about 10 deg. The reflected boundary is located at the depths of 10-20 km. We suppose this later arrival is the reflected wave at the upper boundary of the subducting Philippine Sea plate. The other arrivals can be explained by the reflected wave at a boundary with dip angle of about 30 deg. The configuration and feature of the boundary are very important topics. More detail analysis with amplitude and waveform data of the reflected wave will make it clear.