

The receiver function analysis at the area of the Nobi earthquake (II)

IIDAKA, Takashi^{1*}; IGARASHI, Toshihiro¹; KATO, Aitaro¹; IWASAKI, Takaya¹; JOINT SEISMIC OBSERVATIONS, At the area of nobi earthquake¹

¹ERI, Univ. of Tokyo

1) Introduction

The mechanism of the inland earthquakes is related to the concentration of the strain and accumulation of the stress. It is very important to know the relationship between the stress/strain and fault plane. The 1891 Nobi earthquake is one of the biggest inland earthquakes in Japan. The joint geophysical observations had been done at the area. Based on the results of the previous survey at the Atotsugawa fault region, we found that the lower crust structure and fluid were very important factors to the cause of the inland earthquake. In the Nobi earthquake area, the seismic tomography studies figured out the existence of a low velocity region beneath the fault. The low velocity region continues to the subducting Philippine Sea slab. It can be interpreted that the low velocity region is made by water, which was dehydrated from the subducting slab. It is expected that there is some close relationship between the inland earthquake and liquid released from the subducting slab. We did receiver function analysis at the faults area of the Nobi earthquake.

2) Data

The seismic network deployed by the Japanese University Group of the Joint Seismic Observations and the seismic stations belong to the Hi-net were used.

The earthquakes with the epicentral distances from 30 to 90 degs were used. The earthquakes occurred from Aug., 2002 to Mar. 10, 2011.

3) Results

It has been suggested that the configuration of the subducting Philippine Sea plate is distorted in the southwestern Japan region. We figured out the image of the subducting Philippine Sea plate using the receiver function analysis.

The cross sections along the longitude of 137.5° E and 137° E suggested the negative and positive receiver function boundaries. We can trace the negative and positive boundaries from shallower part to deeper part. The boundaries are interpreted as the upper boundary and oceanic Moho of the subducting Philippine Sea plate. It was found that the Philippine Sea plate is lying in a horizontal beneath Ise bay to Wakasa bay by the previous studies. Our receiver function results also support the result. We can obtain clear image of the crust and upper most mantle of the area using the spatially high dense seismic array deployed by the joint seismic observation.

Keywords: crust, mantle, Receiver function, Nobi earthquake