Japan Geoscience Union Meeting 2013
(May 19-24 2013 at Makuhari, Chiba, Japan)

SSS26-04 Room:303 Time:May 19 09:45-10:00

The seismic experiment with artificial sources at the Nobi fault area (Preliminary Report)

Takashi Iidaka[1*], The Research Group for the 2013 Nobi Fault Seismic Expedition[1]

[1]ERI, 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. We are doing geophysical observations at the area. We have done seismic studies at the Atotsugawa fault area. We obtained several data that the lower crust structure and fluid are 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 structure beneath the fault. The low velocity region continues to the subducting Philippine Sea slab. It is expected that there is some close relationship between the cause of the inland earthquake and liquid in the crust. We did seismic experiment with artificial sources to declare the characteristics of the low velocity zone.

2) Content of exploration

The seismic experiment has done on November 15 and16, 2012. The profile line is located from Fukuchiyama, Kyoto to Ina, Nagano. The length of the profile line is about 280 km. The number of the seismic stations was 1793. Eight artificial sources with dynamite were used. The 500kg and 300kg dynamites are used for 6 and 2 shot points, respectively.

3) Results

We obtained fine seismic record at all of the shots. We can see clear first arrival and later phases. Those later phases seem to the reflected phases from Moho and upper boundary of the subducting Philippine Sea slab. Based on the iso-depth lines of the Philippine Sea slab, which were obtained from seismic studies, the configuration of the Philippine Sea slab is considered to be distorted in this area. The depth of the Philippine Sea slab is shallow at the eastern side. The minimum depth is located beneath the Nobi fault area. On the record section, the reflective zone can be detected at the center part of the profile line. The reflective zone is consistent with the depth of the subducting Philippine Sea slab.

In this area, the resistivity was researched. The low resistivity region was obtained along the fault. We will declare the characteristics of the low velocity region considering the relationship between the resistivity and low velocity regions.

Keywords: crustal structure, artificial source