

## Azimuth estimation of the MeSO-net borehole seismometers based on the orbit of P wave first motion.

# Shunji Sasaki[1]; Keiji Kasahara[2]; Shin'ichi Sakai[3]; Shigeki Nakagawa[4]; Yuichi Morita[5]; Hiroshi Tsuruoka[1]; Naoshi Hirata[5]; Katsuhiko Shiomi[6]; Shutaro Sekine[6]; Kazushige Obara[6]; Toshikazu Tanada[7]

[1] ERI, Univ. of Tokyo; [2] ERI; [3] E.R.I., Univ. of Tokyo; [4] ERI, the Univ. of Tokyo; [5] ERI, Univ. Tokyo; [6] NIED; [7] HSRI, Kanagawa Pref.

### 1) purpose

In general, NS component among two horizontal components of seismometer is installed in the orientation of the true north. However, that of the borehole seismometer in the MeSO-net is installed in the orientation of the magnetic north for the work efficiency. However, there is a possibility that it does not necessarily turn to the direction of design when the borehole seismometer is installed because adjustment of the orientation of the borehole seismometer is difficult. Therefore, estimation of the installation orientation of the borehole seismometer was estimated by comparing the horizontal projection of P-wave first motion with the radial direction from the epicenter to stations.

### 2) data

By the time point of July, 2008, the MeSO-net consisted of 46 stations. Of these, good waveforms were observed at 42 seismic stations when the Iwateken-hokubu earthquake (MJ 6.8, focal depth 110 km) occurred in north part of Iwate prefecture on July 24, 2008.

### 3) methods

Based on the method to comparing the horizontal projection of P-wave first motion with the radial direction from the epicenter to stations, the orientation of borehole seismometer was estimated.

### 4) Results

Of all 46 seismic stations of the MeSO-net, the orientation of the borehole seismometer of 42 stations was estimated by comparing the horizontal projection of P-wave first motion with the radial direction from the epicenter to stations. The frequency distribution of the consequence shows that 10 points of seismic station are less than 2.5 degrees of absolute value of the deviation, 15 points for 2.5-7.5 degrees, 10 points for 7.5-12.5 degrees, and the installation orientation of the borehole seismometer is distributed mainly on the magnetic north. However, there are 7 points where the deviation of the installation orientation exceeds 60 degrees, and some have turned nearly 180 degrees when being installed. These results show that adopted installation method is not necessarily adequate. On the basis of the result provided this time, we will make an effort in future so that installation method of the borehole seismometer is examined in carefulness to be precise in installation.