

Towards Improvement of Strong-motion Evaluation for Earthquakes in Deformation Zone

Hiroyuki Fujiwara[1]; Shigeki Senna[1]; Nobuyuki Morikawa[1]; Nobuaki Kudo[1]; Masahiro Ooi[1]; Shinichi Kawai[1]

[1] NIED

<http://www.j-shis.bosai.go.jp/>

Strong-motion evaluation for earthquakes in deformation zone has not been easy task yet. In many cases of strong-motion evaluation in deformation zone, it is difficult to model velocity structures that are essential to estimate wave propagators because of complicated feature of underground structure. We have had experience that it remains many difficulties in determination of location of faults and evaluation of rupture process in the faults for earthquakes that occurred in Niigata prefecture, such as Niigata-ken Chuetsu Earthquake and Chuetsu-oki Earthquake.

It is necessary to improve strong-motion evaluation in deformation zone that we develop good velocity structure model for sedimentary layers. As the first step for that, we have gathered data on underground structure such as borehole data in the Eastern Japan Sea deformation zone and also have been carried out microtremor survey at 115 seismic observation sites as K-NET, KiK-net, observation sites for seismic intensity of JMA, and those of local governments in Niigata prefecture.

The data obtained from microtremor survey are saved in a database system which is developed by NIED. We have calculated H/V spectral ratio of microtremors for each observation site and have obtained dominant frequency for each site. We estimate characteristics of spectral amplification of geomorphological land classification in Niigata prefecture by using the method of Senna et al. (2008). For a observation site where borehole data exists, we have combine shallow sedimentary structure model and deep sedimentary structure model, and have verified accuracy of the combined model by using comparison of H/V spectral ratio for observation and structure model.

Reference

Senna et al. (2008): Estimation of spectral amplification of ground using H/V spectral ratio of microtremors and geomorphological land classification, Journal of JAEE, Vol.8, No.4, 1-15