



## EXPLORATION OF UNDERGROUND STRUCTURE AT LARGE DISASTER AREA OF KOBE CITY

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### ABSTRACT

The 1995 Hyogo-ken Nanbu earthquake struck the Kobe City and the Awaji Island, Hyogo Prefecture in the Kansai area of Japan. An isoseismal map (Japan Meteorological Agency, 1995) shows that a belt zone of seismic intensity 7 (more than 30% wooden-house collapsed) runs east-northeast to west-southwest across the city. Unfortunately, only one or two strong motion records were obtained in this area. Possible explorations of the disaster were studied using aftershock records of temporal stations. We concluded that the heavy damage caused by the mainshock is strongly connected with the edge of the sedimentary basin structure and a thin soft surficial layer. We also estimated the thickness of sediments from the SP converted wave of the aftershock data. After the mainshock, reflection surveys by several organizations such as Geological Survey of Japan (GSJ), Hyogo Prefecture, and CEORKA, downhole survey by GSJ, and the refraction survey by Ministry of Education were done. Most of their original idea was to find the buried fault under Kobe city. They did not find the seismic fault beneath the disaster area. However, they gave us valuable information about the basin-edge shape and velocity structure of the sediments. Using the obtained basin structure, Pitarka *et al.* (1995) succeeded in simulating aftershock data and showed the ground motion amplification of the most damaged area by the constructive interference between the direct wave and the basin-induced wave from the edge of the basin. Kawase (1995) simulated peak velocity distribution during the mainshock along the North-South line of Sannomiya area using the basin-edge model and pointed out that the large disaster zone were generated by the basin-edge effect. Our research group also estimated the velocity structure of surface layers near some of the aftershock observation stations.

Moreover, an explosion refraction survey project organized by Ministry of Education were carried out to search physical properties of the Awaji-Rokko fault zone. Our strong motion seismology group observed signals in and around Kobe city. These records also provide the information of underground structure. The survey data from almost all the participating organizations will be opened in the near future.

### REFERENCES

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**KEYWORDS** : reflection survey, refraction survey, the 1995 Hyogo-ken Nanbu (Kobe) earthquake,