

## Three dimensional subsurface structure model of the Osaka basin

# Haruo Horikawa[1], Kiyohide Mizuno[2], Kenji Satake[1], Haruko Sekiguchi[1], Yuko Kase[1], Yuichi Sugiyama[1], Hiroshi Yokota[3], Masaki Suehiro[4]

[1] Active Fault Research Center, GSJ/AIST, [2] Active Fault Research Center,GSJ/AIST, [3] Hanshin Consultants Co.,Ltd., [4] Hanshin Consultants Co., Ltd.

Osaka is located in the Kansai area, central Japan, and one of the most densely populated regions in Japan. It is in a sedimentary basin called Osaka basin, and has several active faults. Hence this region will suffer destructive damage if large earthquakes occur on these faults, and seismic hazard assessment will be required to reduce loss of life and economical damage.

Active Fault Research Center (AFRC), National Institute of Advanced Industrial Science and Technology (AIST) aims to make a seismic hazard map for this region. One of the characteristics of the hazard map is to make full use of geological information such as geometry of active faults. We will construct fault models on the basis of the information, and calculate spontaneous rupture processes over the faults [Kase et al., this meeting], and calculate ground motions from the dynamic source models with a three-dimensionally heterogeneous subsurface structure [Sekiguchi et al., this meeting]. In this presentation, we will report a three-dimensional subsurface structure model of the Osaka basin used in this hazard estimation.

Our modeling of crustal structure consists of two steps. In the first step, we construct a geological structure model, in which the depth distribution of several key layers and the boundary between sediments and basement rock are described. We explicitly take into consideration discontinuous structures due to faults. We then convert the geological model to a velocity structure model. We make use of the depth and age of sedimentation in the conversion for sediments. Since it is quite difficult to construct a three-dimensional geological model in one time, we first construct many cross sections (i.e., two-dimensional geological models) of the geological structure at various locations and combine them into a three-dimensional one.

The dimensions of the crustal model is 28 km (E-W) x 45 km (N-S) x 4 km (depth), which fully covers Osaka. We include three faults of Arima-Takatsuki Tectonic Line, Uemachi fault, and Ikoma fault, and make 91 E-W cross sections of the geological structure to make a three-dimensional model. The maximum depth of the basement is about 1.5 km. The depth of the basement is shallow beneath the Uemachi terrace, which ranges from north to south in Osaka. Hence Kawachi area, which is located between the eastern boundary of the Osaka basin (Ikoma mountains) and the Uemachi terrace, forms a small basin in the Osaka basin. These features agree with the results of previous studies.