

Observation of earthquakes in Kii Peninsula under the Special Project for Earthquake Disaster Mitigation in Urban Areas

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1. Introduction.

Surveys of crustal structure and deep structures of active faults were started in 2002 under the Special Project for Earthquake Disaster Mitigation in Urban Areas (Daidaitoku) . Observations of earthquakes in Kii Peninsula have been carried out under the project since 2004. The purpose of the observations is to improve the accuracy of estimation of strong motions of the large earthquakes by analyzing the earthquake data to determine the crustal structures and deep structures of active faults and the Philippine Sea plate. We report the outline of the observation system and data processing of the temporary seismic observations.

2. Observation station and observation system.

We set the temporary observation stations to survey the structure of the Philippine Sea plate, along the survey line of the seismic survey, from the southern coast of Kii Peninsula to the middle of the Kinki district. as shown in Fig.1. We also collect the data at routine observation stations of the Earthquake Research. Institute, the University of Tokyo, HINET and JMA (JAPAN Meteorological Agency). The observation stations are set without connecting by the telephone or satellite communication link but set as individual stations in order to install in the mountains where the noises are small.

An observation system set at each observation station consists of a seismometer (L4C, 3 components with a natural period of 1s.), a data logger, a solar panel and several batteries. The diagram is shown in Fig.2. The electric power from solar panel and battery is supplied to the data logger through a voltage controller. The signals from the seismograph, through a shunt resistance (a damping resistance), is continuously recorded on a compact disc (CF) card (2GB) in the data logger (LS7000XT). The sampling of the data is 100Hz, and the accuracy of time is about 1ms with a GPS receiver built in the logger.

We collect the data every month by exchanging the CF card. Two or three batteries (12V36AH) are used at an observation station with a solar panel. However, some exhausted batteries are also exchanged, when the charge with the solar panel is not complete.

3. Data processing.

From the continuous data (Win Format) collected at individual observation stations, events data are cut out by using a trigger list of the routine observation network. The data are merged to the routinely observed data set. The series of work is effectively carried out by using some shell scripts on UNIX. We have processed 9806 earthquake from May to October in 2004.

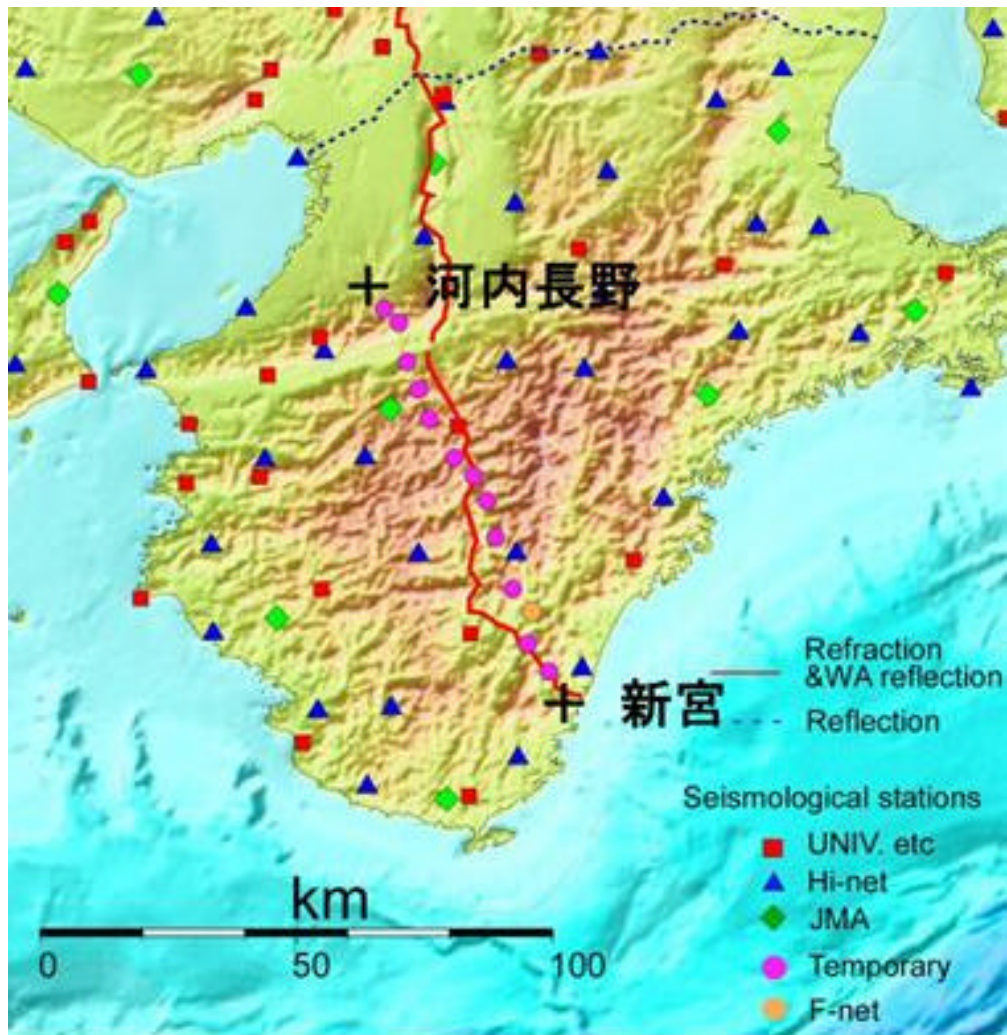


Fig1. 観測点の配置 (Distribution of observation stations)

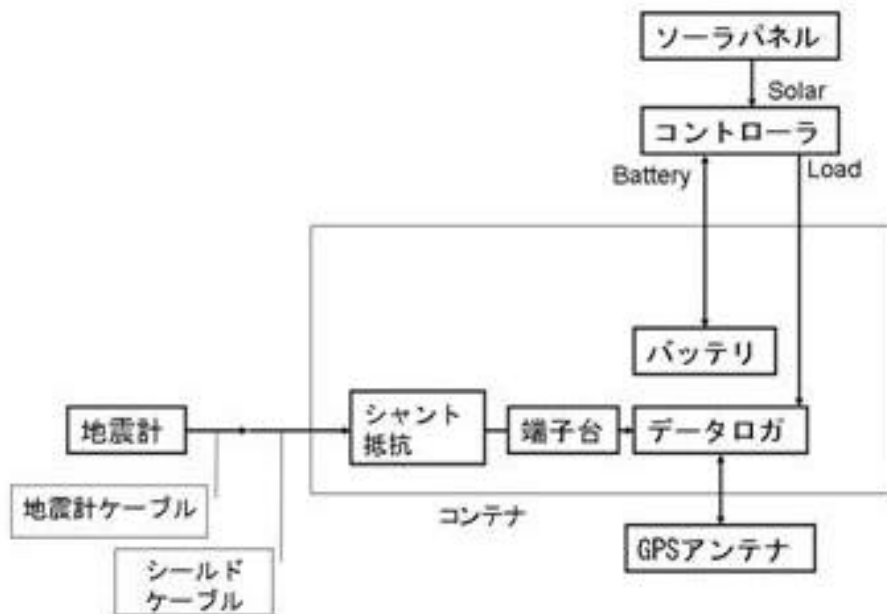


Fig2. 設置図 (Block diagram of the observation system)