

# An Investigation of Deep crustal resistivity structure beneath the seismic gap in eastern part of Shimane Prefecture

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## 1.Purpose

The purpose of this study is to estimate a deep crust resistivity structure in the seismic gap in the eastern part of Shimane Prefecture, which is adjacent to the seismic area in the western part of Tottori Prefecture. In this presentation, I would like to give the preliminary report of the wide band MT observation carried out in the above area in fall of 2003.

## 2.Background of this study

The research group has investigated a deep crust resistivity structures in the measurement lines that traverse a linear seismic activity area along with the coastal part of Japan Sea, including Yoshioka and Shikano seismic fault of Tottori earthquake in 1943, M7.2 and the epicenters of the remarkable earthquakes in the eastern part of San-in region, for example, Western Tottori earthquake in 2000, M7.3, and Tottori-ken Chubu earthquake in 1983, M6.2. As the result, it was found that in the eastern part of San-in region, a low resistivity area exists in the deep crust part under the seismic region that is a high resistivity area, along with the seismic activity area in the almost east and west direction. However, the investigation that has been carried out so far limited to the seismic area. We cannot answer whether the above feature can be seen only in the seismic activity area or not. Therefore we thought that a comparative study in a non-seismic area should be required. Recently, a model where fluid in a lower crust relates to the inland earthquake occurrence mechanism was suggested. Whether a deep crust resistivity area that suggests the fluid exists under the non-seismic area in the eastern part of Shiamane prefecture or not should be cleared. By reviewing and comparing it with the existing structure data, the cause of inland earthquakes and the possibility of earthquake occurrence in San-in region are examined from the viewpoint of the resistivity investigation.

## 3.Observation

A wide band MT observation was carried out from the end of Oct. to the beginning of Nov. in 2003. The observation staff consists of 24 members from 6 organizations. Total 13 Phoenix measurement devices, which come from Tokyo Institute of Technology, Tohoku University, National Institute of Polar Research center, Earthquake research Institute, University of Tokyo and Disaster Prevention Research Institute, Kyoto University, were used to observe geomagnetic field and electric current. The observation items are 2 components of electric field (east-west and south-north) and 3 components of magnetic field (east-west, south-north, vertical). Magnetic field reference points were provided in Kumano in Miyazaki city. Fortunately, two global big geomagnetic storms happened from Oct 29 to 31 in the observation period and a good record was obtained on almost all points. According to the spot news for geomagnetic storm shown in the homepage of Kakioka Magnetic Observatory, Japan Meteorological Agency, the description of these storms is as follow: The first storm starting at Japan time 15:11 on Oct. 29 had maximum intensity of 423nT of the geomagnetic horizontal component, which was the 19th record among the geomagnetic storms that had been observed at Kakioka Magnetic Observatory since 1924. The second one on Oct.31 had 354nT of the geomagnetic horizontal component.