[JJ] Evening Poster | S (Solid Earth Sciences) | S-EM Earth's Electromagnetism

[S-EM16]Electromagnetic Induction in the Earth and Planetary Interiors, and Tectono-Electromagnetism

convener:Ken'ichi Yamazaki(Disaster Prevention Research Institute, Kyoto University), Koki Aizawa(Institute of Seismology and Volcanology, Faculty of Sciences, Kyushu University)
Thu. May 24, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
This session welcomes papers on electromagnetism in the Earth and planetary interiors. The topics include but not limited to electromagnetic phenomena associated with earthquakes and volcanism, electrical conductivity structure, laboratory experiments, results of simulations, new equipment for observation, and methods of data analysis.

[SEM16-P04]A research report on the fundamental investigations of an electrical resistivity structure beneath Chugoku and Shikoku regions, southwestern Japan(2017)

*Ichiro Shiozaki[1], Tomofumi Uto[1], Shinji Yamamoto[2], Yasuo Ikezoe[2], Hiroshi Hataoka[2], Tatsuya Noguchi[1], Hiroyuki Kogai[2], Kei Nakanishi[2], Hideki Murakami[3], Naoto Oshiman[4], Yoshihisa Iio[4], Kazuya Ando[5]
(1.Graduate School of Engineering, Tottori University, 2.Faculty of Engineering, Tottori University, 3.Research and Education Faculty, Kochi University, 4.Disaster Prevention Research Institute, Kyoto University, 5.San'in Kaigan Geopark Meuseum of the Earth and Sea)
Keywords:electrical resistivity, Chugoku and Shikoku regions, fundamental investigations

In order to contribute to a reduction in damage caused by earthquakes and volcanic eruptions, heterogeneities of crustal and upper mantle structure should be clarified based on fundamental investigations of electrical resistivity structure in Chugoku and Shikoku regions, southwestern Japan arc. Our research group has shown that there is a clear relationship between resistivity and seismicity in the San'in and Shikoku regions. In the eastern part of San'in region, it was found that a conductive area exists in the deep crust part under the seismic region, which is a resistive area, along with the seismic activity area stretching nearly in the east and west direction. Recently, harmonious research results have been shown from geodetic GNSS(GPS) data analysis by Nishimura (2015). Assuming that inland earthquakes occur because of local stress concentration caused by heterogeneity beneath a seismic activity band(Iio, 2009), it is necessary to improve spatial data and to clarify the heterogeneity in this area hereafter. On the other hand, in the Shikoku district, it was suggested that the distinctive low resistivity region exists in the upper crust mainly from the survey results in the outer belt, and that there is a clear relation between the low resistivity and low seismicity in the central and the western area. In order to understand the earthquake phenomenon uniformly, it is important to elucidate the generation environment and the principle as well as the activity style of the slow earthquake (Obara(2017)). Fundamental investigations are required to clarify the regional characteristics of it as a whole.
In this background, we aimed to elucidate the crustal heterogeneity structure under the Shikano and the Yoshioka fault which is the 1943 Tottori earthquake fault, wideband MT observation was carried out at 10 points in the surrounding area in San'in region and to grasp the regional characteristics of the large scale resistivity structure, observations conducted at 8 sites in the observations gap area in the Shikoku district. 1D Occam inversion analysis based on determinant impedance was performed and integrated with existing MT data to estimate the preliminary spatial resistivity structure distribution. As a result, in San'in region, it is generally harmonious with the former studies, but a structure in which the low

resistivity region is sandwiched in the fault region was suggested. In the Shikoku district, the resistivity in the shallow parts of the crust may seem to be in harmony with the major geologic belts. In addition, the resistivity in the mid crust shows the existence of a relative high/low resistivity boundary in the vicinity of the MTL, consistent with the existing research. It was shown that clear correspondence between the high resistivity and high seismicity on the north side of the MTL. Meanwhile, on the south side, an interesting feature was shown that crustal earthquakes occur mainly on the east side of the high resistivity zone that passes from NNE to SSW in the central part of the Shikoku district. It is necessary to clarify the nature of this high resistivity region by performing fundamental investigations with high resolution.

Acknowledgments : This study was supported by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) of Japan, under its Observation and Research Program for Prediction of Earthquakes and Volcanic Eruptions, and also supported by 2017 Tottori Prefecture Environmental academic research promotion promotion project. We would like to express sincere gratitude for the Nittetsu Mining Consultants Co. Ltd. kindly let us use their continuous geomagnetic records as remote references. We used joint research equipment of Kyoto University Disaster Prevention Research Institute for observation of this research.