

## A Summary report on the investigations of an electrical resistivity structure beneath Chugoku and Shikoku regions, south

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The purpose of this study is to estimate crossing and longitudinal electrical resistivity structure sections in the southwest Japan arc in order to clarify the relation between the deep crustal low resistivity region and seismic activities. Therefore, based on the investigation research of the electrical resistivity structures in Japan arc and the southwest Japan arc, in Sanin region, it is important to clarify the relation between earthquake occurrences out of the strain concentration zone, volcanoes not having eruption records for a long time and crustal fluid, and to find the structural heterogeneity in the inland earthquake occurrence area, the inland seismic gap (beneath the third class and quaternary volcano) and deep low frequency earthquakes. In Shikoku region, it is also important to find the relation between the occurrence pattern and structural locality of crustal earthquakes and deep low frequency earthquakes and the fluid supposed to be supplied from ocean plate subduction.

Our research group has shown that there is a clear relationship between resistivity and seismicity in the Sanin and Shikoku regions. We investigated deep crustal resistivity structures in the measurement lines that traverse a linear seismic activity area along with the coastal part of Japan Sea. As the result, 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

However, Ozaki et al. (2011) showed that the crust has generally a high resistivity in the earthquake occurrence region in the middle-west part of Tottori pref. (2002, Mj5.3). This observation fact conflicts with the model advocated by the group including the author that has studied electrical resistivity in Sanin region. That is, there is a possibility that the deep low resistivity area beneath the Sanin region does not exist in series. Assuming that inland earthquakes occur because of local stress concentration caused by heterogeneity beneath a seismic activity band (Iio, 2009), the heterogeneity should be clarified by a spatial and structure analysis, and a more detailed surfacial structure data should be completed hereafter.

On the other hand, in the Shikoku region, the same investigation was carried out mainly in the outer zone, the south side of MTL and the result suggested that a remarkable conductive area should exist in the upper crust of the outer zone, and that the conductive area in the central and western part should have a clear relation with the non-seismic area.

These studies suggest that high conductivity (low resistivity) is possibly caused by the existence of deep crustal fluids, which probably play an important role in the inland earthquake occurrence mechanism of these regions. As one of the possible interpretations of water supply system, it is thought that the fluids in the deep crust are supplied from the subducting Philippine Sea plate by means of the dehydration processes. However, the existence of the plate is not thoroughly identified in the geological inner zone of the southwestern Japan Arc. Therefore, in order to grasp a whole tectonic setting, from the fore to the back arc side in the southwestern Arc, quantitative discussions based on the wideband MT survey covering whole these regions should be required. Consequently, for making the island arc crossing structure section in the southwest Japan arc, an additional structure investigation in the unmeasured area, the area of Setouchi as the main area is required to clear the northern edge of Philippine Sea plate.

In this presentation, the summary report on joint structure analysis result in Chugoku and Shikoku regions and key features of spatial resistivity distributions in these regions, using the recent data acquired in the Setouchi area incorporated in the existing data, will be shown.

Keywords: electrical resistivity, Chugoku and Shikoku regions, heterogeneity