

Preliminary report on the investigation of the resistivity structure in the southwestern part of Shikoku district, Japan

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Considering the background mentioned above, in order to clarify if the low resistivity region also exists in the southwestern part of Shikoku district, the wide band MT investigation of the crustal resistivity was carried out.

Here, the general description of the observation and the result of a preliminary structural analysis are reported.

Introduction: As the result of the investigation of the Resistivity Structure in the Shikoku District by the authors, it is found that a low resistivity region clearly exists within the upper crust part in the outer band of the Shikoku district. For example, the existence of a low resistivity region (a few ohm m) in the upper crust part is confirmed by the investigation result that was carried out in Chichibu band, the western part of Shikoku district. However, it is well known that earthquake generated in the upper crust part never happen there. On the other hand, in the eastern part the low resistivity region has a remarkable relation with the region where earthquake happens in the upper crust, and in the central part, it has the relation with the region where earthquake never happen.

Considering the purpose mentioned above, in order to clarify if the low resistivity region also exists in the southwestern part of Shikoku district, the wide band MT investigation of the crustal resistivity was carried out.

Here, the general description of the observation and the result of a preliminary structural analysis are reported.

Observation: The observation was carried out on seven (7) points on a measuring line southward from Nishi-Tosa village of Kochi pref. toward Nakamura city, along with Shimanto river. The observed items include 2 components of an electric field and 3 components of a magnetic field. The sites where noise from commercial power supplies and/or telephone cables was less, were selected as the observation point. The observation period was 16 hours from the evening to the next morning, and the record for 3 days was obtained on each site.

Result: Sounding curves of Apparent resistivity and phase difference, which were obtained by the observation, shows that a low resistivity layer exists under ground in this region.

1-D resistivity structure analysis by an invariant impedance was implemented as a trial, to see the characteristics of the regional structure. As the result, the structure model has following characteristics.

- (1) Generally, the resistivity of the crustal structure shows 100 ohm-m.
- (2) A low resistive layer with 1-10 ohm-m is found around the depth of 3km ~10km in the central part of this observation area.
- (3) A contrast of the resistivity structure is seen, with a border of Nakasuji tectonic line. Accordingly, the crust of the north side shows low resistivity and that of the south side shows high resistivity.