

Electrical Conductivity Structure across the Nankai Subduction Zone by land and marine MT surveys

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Great earthquakes(over M8.0) periodically occurred along the Nankai Trough. The rupture region at the 1944 Tonankai earthquake coincided with the slip region with tsunami, so that the off-Kumano region is one of the typical seismogenic zones with great earthquakes.

It is well known that existence of fluid is a key parameter for earthquake occurrence. Also, electrical conductivity of crustal material roughly reflects fluid content at low temperature condition. Therefore, electromagnetic surveys to image a conductivity structure around a seismogenic zone can be useful to discuss mechanisms of earthquake generation and rupture propagation.

In this study, we conducted electromagnetic surveys on the Kii peninsula and on the ocean bottom around the Kumano Basin to obtain the electrical conductivity image around the 1944 Tonankai earthquake region. Here, we introduce the outline of this observation and show preliminary results.

Marine magnetotelluric surveys were carried out at 9 sites by using ocean bottom electromagnetometers (OBEMs). Nine high-frequency and two low-frequency OBEMs are used to image the island arc crust and the subducting Philippine Sea plate, respectively. On the Kii peninsula, low-frequency electromagnetic data is obtained at 3 sites. On-land and marine electromagnetic data can allow us to image the deep crustal and mantle conductivity structure near the coast line.

A preliminary result obtained by HF-OBEMs show an underlying conductive zone located below the splay fault (Park et al., 2002). Detailed imaging of the conductivity structure is undergoing.