

Resistivity image along the Kii peninsula and the ocean bottom around the Kumano Basin

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Great earthquakes (more than M8.0) periodically occurred along the Nankai Trough and the off-Kumano region is one of the typical seismogenic zones with great earthquakes. Therefore, low frequency tremors were observed below the Kii peninsula (Obara, 2002). It has been reported that the low frequency tremor activity is related with the existence of fluid. It is well known that existence of fluid is a key parameter for earthquake occurrence. Also, electrical resistivity of crustal material roughly reflects fluid content. Therefore, electromagnetic surveys to image a resistivity structure can be useful to discuss mechanisms of earthquake generation and rupture propagation.

To obtain the resistivity image around the 1944 Tonankai earthquake region, we carried out electromagnetic surveys on the Kii peninsula and on the ocean bottom around the Kumano Basin. On the Kii peninsula, low-frequency electromagnetic data is obtained at 3 sites. The two dimensional resistivity model below Kii peninsula was constructed by forward modeling. We found two characteristic structures; (1) a resistive layer dipping northwest at depths of 40-100km, (2) a conductive block in the center of this study area at the depth 25-50km. The later structure lay on the former dipping resistive layer. It is interesting that the low frequency tremors distribute around this structure. Marine magnetotelluric surveys were carried out at 9 sites by using ocean bottom electromagnetometers (OBEMs). Nine high-frequency(HF) and two low-frequency(LF) OBEMs are used to image the island arc crust and the subducting PhilippineSea plate, respectively. The resistivity image obtained by HF OBEMs data shows that the low resistivity layer at the depth of 10 km overlies the deeper resistive layer. Moreover, We will discuss the resistivity image using all electromagnetic data.