

Marine magnetotelluric survey of the crustal structure in Eastern Nankai

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The inclination of resistivity below the sea floor has useful information on the characteristics in the generation mechanism of earthquake, and it also has a key to investigate the distribution of natural resources such as oil and methane hydrate. It is because they all could be related to interstitial fluid migration and the resistivity value is sensitive to the existence of water. To clarify the crustal and mantle resistivity structures around the Eastern Nankai, off the Tokai region, Japan, marine magnetotelluric (MT) soundings were carried out in 2007. The Eastern Nankai is located where unconsolidated sediments on the subducting Philippine Sea plate are underplated to the southwest Japan arc above a mega-thrust seismogenic zone and marine MT survey is done in this study for the first time. Our two-dimensional inversion model demonstrates the electrical resistivity structure in the crust and mantle, and resembles to a seismic reflection section. The resistivity structure of Eastern Nankai has unique features. Comparing the resistivity structure of Central Nankai, the resistivity value around the plate boundary of Eastern Nankai is higher than that of Central Nankai. The resistivity structure has a possibility to explain the conditions and elements causing mega-thrust earthquake. And there is a difference of a big feature at the topography of the seafloor between Eastern Nankai and Central Nankai. Eastern Nankai is uneven ground while Central Nankai's ground is smooth. So Eastern Nankai's data is affected by three dimension geographical features. In fact, the value of skew show over 0.3, it is said that there is three dimension geographical effect when the value of skew is over 0.3, and the MT response of TM-mode in Eastern Nankai performs lower quality than that of TE-mode does. So what to do next is the consideration of three dimension geographical effect. The hybrid of 3D forward code and 2D inversion code will make resistivity structure in this region more correct, and it will also make TM-mode data's coherency higher enough to be used in the 2D inversion.