

## Regional Conductivity Distribution of the Philippine Sea Plate

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We report on models of the electrical conductivity distribution of the Philippine Sea Plate by using large-scale voltage differences observed with four submarine telecommunication cables in the region.

Structures of the Philippine Sea plate is little known mostly because of poor observatory distributions in the region. However, development of tomography technique in seismology revealed a new view of the plate. For instance, Nakamura and Shibutani (1998) suggested that the western part of the Philippine Sea plate has an extremely thick lithosphere while the eastern part is consistent with a conventional plate model.

In this study, we aim to establish a 3D model of the electrical conductivity distribution in the region and to reveal large-scale heterogeneities which may be related to the tectonics of the region.

Data used in this study are large-scale voltage differences between Guam and Ninomiya (2700km), Guam and Baler (2716km), Guam and Gushikami (2160km), and Gushikami and Ninomiya (1500km) as well as the geomagnetic field at Kakioka. A robust procedure developed by Chave and Thomson (1989) was applied to the data set of 1-minute values and four sets of the Magnetotelluric (MT) responses were obtained at periods from 120 sec to 13 days.

We attempt to model a three dimensional conductivity distribution of the Philippine Sea plate by using a finite difference method (Mackie, et al, 1994). The bathymetry and thickness of sediment in the region are included as a priori information. The conductivity and thickness of the lithosphere are the main parameters to be searched.

At first, effects of grid spacing on electromagnetic fields numerically obtained at the surface of the Earth were carefully examined to effectively compute the enhancement of the electric field at land-sea boundaries. As a result, a 158 x 143 x 29 grid was chosen as the optimum grid to cover a region of 5045km x 4983km x 997km at periods from 3600 to 86400sec. Second, numerical and observed MT responses were compared to check the sensitivity of thickness and conductivity of the lithosphere.

We will discuss effects of heterogeneity within the plate.