The Electrical Conductivity Structure of The Oldest Pacific: Preliminary Results from Magnetotelluric Observation Data of Pacific Array, Oldest-1

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With the complex regional history from the creation between Izanagi-Farallon-Phoenix plates system to the oldest crust of the Pacific over 180 Ma, the west Pacific basin between Northern Mariana, Marshall Islands, and Micronesia has been considered as an ideal place to study the anisotropy structure related with the crustal evolution and the thermal history of oceanic lithosphere-asthenosphere system (LAS). As an element of the international collaboration Pacific Array project, which aims to deploy “array of arrays” over the entire Pacific, a joint research group of Japan-Korea scientists conducted in-situ ocean bottom geophysical observation of the Oldest-1 region for a year from 2018 to 2019. 12 ocean bottom seismometers and 7 ocean bottom electromagnetometers (OBEMs) provided by Earthquake Research Institute, The University of Tokyo, has been deployed and recovered on vessels (RV Isabu and RV Onnuri, respectively) of Korea Institute of Ocean Science and Technology (KIOST).

Here we report the preliminary analysis of magnetotelluric data from 7 OBEMs of the Oldest-1 array. After the initial processing to correct anomalous peaks in time series, shift of internal clocks, and the effect from bathymetry/land-sea distribution, we estimated a 1-D regional mean profile of electrical conductivity. In the context of the thermal evolution process of oceanic LAS, the 1-D electrical structure represents the oldest end member of the Pacific basin.

Keywords: Pacific Array, Lithosphere-Asthenosphere System, Ocean Bottom Electromagnetometer, Marine Magnetotellurics

