

MT survey and its preliminar result at Boso Peninsula, Japan

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A magnetotelluric (MT) survey is one of the methods to understand the underground electric properties. In Boso area, Japan, there are three main topic to perform the MT survey; (1) to estimate underground resistivity structures related to the plate boundaries, seamount, asperities, and slow slip events, (2) to obtain a regional realistic resistivity structure for the numerical simulation in generation and propagation mechanisms of electromagnetic precursors, and (3) to develop a new MT technique to reduce the cultivated noises such as DC driven trains. In these aims, we decided to carry out the MT survey in Boso area, Japan during 2014-2016. Due to sensing down to 100 km depth, we use induction and fluxgate magnetometers. The first MT survey in 2014-2015 had 21 and 6 stations for induction and fluxgate type magnetometer, respectively. We checked the observed data and analyzed the local midnight time (02:00-04:00(JST)) data because of noises and performed 1D inversion.

The preliminarily results show that we can presume the resistivity structure about 80 m-2 km depth from the surface. A typical resistance down to 200 m depth was 1-10 ohm-m and below 200 m depth, a specific resistance was estimated at 0.1-1 ohm-m at many stations. This suggests that there is a geological boundary around 200 m depth. In comparison with the geologic structure interpreted by the reflection seismology data, the upper part seems to be the Shimousa Group, and the lower, the Kazusa Group (Earthquake Research Committee, 2005).

To presume resistivity structure at the deeper depth, it is necessary to remove the artificial noises from observed MT data. These observed noises have characteristics of transient signals and processes in time domain are required such as singular spectrum analysis and neural network analysis. Further preprocessing will be essential.

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