E110-009 **Room: 101B** **Time: May 29 16:00-16:15**

Development of marine 3D MT inversion scheme

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In recent years, a number of seafloor electromagnetic (EM) experiments have been carried out by using ocean bottom electromagnetometers (OBEMs). The density of marine Magnetotelluric (MT) data have been increasing so that imaging electrical conductivity structures under the seafloor in three dimensions is now feasible. In practice, as shown in a separate presentation by Baba et al. (2008, in this meeting), we deployed OBEMs in a two-dimensional array in the Philippine Sea. The present study aims to develop a practical and efficient code to invert EM data from this experiment to a model of 3-D conductivity down to the mantle transition zone.

For this purpose, we have modified WSINV3DMT (Siripunvaraporn et al., 2005) so as to be able to invert marine MT data. WSINV3DMT is known as a full three-dimension inversion code for land MT data, and is based on the data space approach. In order to suitable for marine MT data, we have introduced two significant changes to the original code so that it can include bathymetry features and allows observation sites (the input/output points) to be located on the seafloor as well as the Earth's surface. In an original code, the observation sites have to be located only at the center of the top of each block which has conductivity of land. The new code describes detailed bathymetry by assigning a volume average of the conductivity to each block. This scheme enables us to use relatively large grid size even for the blocks including the sea floor. Responses can be calculated at arbitrary location by interpolating the electromagnetic fields at grid points. We have examined by using synthetic data that these new treatments do not cause significant reduction of the accuracy.

Interpolation, however, causes some difficulty in calculating sensitivity matrices, because the sensitivity also has to be calculated by interpolation. Point source make it fast to calculate sensitivity matrices because of reciprocity relation of Green's function.

We will present the efficiency of the forward part of our new code, and results of verification of our 3D inversion scheme.