

Japan Geoscience Union Meeting 2011

(May 22-27 2011 at Makuhari, Chiba, Japan)

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SEM037-P07

Room:Convention Hall

Time:May 26 14:00-16:30

Preliminary result of OBEM survey around the Japan Trench

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Japan Trench system is an interesting scientific research field to understanding subduction processes including interplate earthquakes and volcanic activities. We conducted natural source electro-magnetic surveys around Japan Trench using newly developed small ocean bottom electro-magnetometers (OBEMs) (Kasaya et al., 2009). The small OBEM consists of a 17-inch glass sphere involving data logger and battery, sensor unit (fluxgate magnetometer, tilt meter and thermo meter) in a small metallic pressure housing, and electrode arm unit with arm-folding system. The electrode arms are folded during surfacing, which enable easy recovery operation. 24bit and 16 bit AD converters are included for the electric field and the other measurements, respectively. Sampling rate can be settled between 0.125 and 240 seconds. The rate can be switched during observation, which enable to obtain wide-band MT/GDS responses.

We deployed the 6 small OBEMs and 5 conventional OBEMs across Japan Trench from 900m to 6000m deep during 2009-2010. In addition, 4 or 5 small OBEMs will be deployed in 2011. High quality data were obtained in some stations although geomagnetic disturbance had been weak. Preliminary analyses imply strong bathymetric and coastal effects in the MT/GDS responses. These effects will be deeply discussed in the presentation for 2-D/3-D resistivity modeling.

Keywords: magnetotelluric, subduction zone, OBEM, Japan Trench