

Preliminary report on wide-band MT survey across southern part of Tohoku (on Agano-Samegawa line)

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In order to elucidate dynamics of the intense crustal activities induced by the 2011 great Tohoku earthquake in Tohoku area, several field surveys have been promoted under the Earthquake and Volcano Hazards Observation and Research Program by the MEXT. Among these field surveys, this research tries to obtain a 3-D image of electrical resistivity distribution beneath the southern part of Tohoku arc, where intense induced earthquake activities took place in the fore-arc area of Iwaki and North Ibaraki, and intense strain rate accumulation was observed in the back-arc area along the Niigata-Kobe tectonic line. Electrical resistivity is especially sensitive to existence of conductive interstitial fluids and their connectivity. By combining the resistivity structure with structures of seismic wave velocity or attenuation, spatial distribution of the seismic foci and spatial distribution of the crustal deformation obtained from the GNSS survey, we try to elucidate subsurface physical properties and mechanism of those induced activities. Thus seismic and GNSS surveys have been also performed along the same observation line as ours.

In FY 2015, we did a wide-band MT survey along the Agano-Samegawa observation line from Nov. to Dec., 2015. We installed 15 wideband MT instruments along the 150km line and obtained 32Hz and 1024Hz 5-channel EM data (of two horizontal electric field and three magnetic field components). We also used two component horizontal magnetic field data as remote references, which were obtained at Okura, Yamagata Pref. by GERD Corp. and N-Iwoyama, Miyazaki Pref. by Dr. K. Aizawa, Kyushu University. In this presentation, we will introduce spatial characteristics and period dependence of the obtained MT and GDS responses together with inter-station horizontal magnetic field transfer functions. We will also show primary interpretation on subsurface structure beneath the area from those response functions.

Keywords: Magnetotelluric Survey, Southern Part of Tohoku District, crustal activities induced by the 2011 Great Tohoku Earthquake, electrical resistivity, crustal fluids