

Wideband MT survey in Aridagawa non-volcanic earthquake swarm region, Wakayama Prefecture

*Makoto Tamura¹, Makoto Uyeshima², Tsutomu Ogawa², Yasushi Yamauchi³, Takehiro Inagaki⁴, Atsushi Kato⁵

1. Geological Survey of Hokkaido, Hokkaido Research Organization, 2. Earthquake Research Institute, The University of Tokyo, 3. TEPCO., Power Grid, 4. KEPCO, 5. J-Power

An active non-volcanic earthquake swarm has been observed at the north western Wakayama area. Kato et al. (2010) performed high-resolution tomographic imaging of seismic velocities and proposed that these swarms are triggered by circulating fluids and fluid pressure fluctuations driven by the thermal anomaly of the solidified diorite magma. In 2009, Uyeshima et al.(2010) performed MT survey in the Aridagawa area, southern margin of swarm activity, and detected conductive anomaly structure that presume the existence of connected interstitial water. But the details of the relationship between the swarm activity area and resistivity structure have not still understood well.

In 2015, we performed wideband MT survey at another profile across the Aridagawa area. Five component electromagnetic fields were measured at 5 sites by ADU-07 (Metronix Geophysics). We obtained continuous 1024Hz data, which were saved in the CF-memory once per an hour. After the survey, we made 32Hz and 1Hz data by downsampling. To avoid leakage current noise from the DC train (the Kisei main line), in analyzing the 1024 Hz data, we used only midnight data that was obtained from JST 2 to 5 a.m..

MT responses of a frequency band of 384-0.039Hz were estimated using remote reference method and the robust processing code BIRRP (Chave and Thomson, 2004). From the GB decomposition analysis (Chave and Smith, 1994, Toh and Uyeshima, 1997) and geological features, we considered that the optimum regional strike is in the EW direction. We tried to obtain a 2-D resistivity structure along N-S profile with the aid of the REBOCC 2-D inversion code (Siripunvaraporn and Egbert, 2000). In this presentation, we show the results of 2-D inversion and the relationship with the swarm activity.

Keywords: Wideband MT survey, Aridagawa region, Wakayama Pref., non-volcanic earthquake swarm region