R003-10
Zoom meeting A ：11/3 AM2 (10:45-12:30)
11:30-11:45

Detection of Fluid Passes by Audio-frequency Magnetotelluric Survey in the Wayang-Windu Geothermal Area, Indonesia

#Tada-nori Goto, Yuji Yamada[2)], Mohamad Nur Heriawan[3)], Irwan Iskandar[3)], Katsuaki Koike[2)]
Univ. Hyogo,[2)]Kyoto Univ.,[3)]Institute of Technology Bandung

In the Wayang Windu geothermal field, Indonesia, the hydrothermally alteration zones are detected based on the remote sensing, which are located near the of topographical lineaments. The alteration zones are also characterized as high radon anomalies in soil gas. These findings imply that fracture zones in this field play an important role for path way of deep high-temperature fluid to the land surface, and also have a potential of deep hydrothermal reservoirs. For verification of this hypothesis, geophysical surveys at the ground surface of the Wayang Windu field with the non-destructive way are useful. In this study, we conducted the audio-frequency magnetotellurics (AMT), which is one of the electromagnetic geophysical surveys in Wayang Windu. Since the resistivity greatly decreases at buried water-rich/clay-rich geological zones, the AMT survey is known to be a powerful tool for imaging the fracture zones and related hydrothermal alteration zones beneath the geochemical anomalies. The AMT data were obtained at 38 sites in northern and middle of the Wayang Windu field. The obtained apparent resistivity includes the static shift and distortion effects. We applied the spatial averaging of apparent resistivity densely obtained in this study, and estimated the degree of static shift at each site. As a preliminary result, we constructed quasi three-dimensional (3-D) resistivity structure in the Wayang-Windu area from the surface to the depth of about 1km. It is based on a one-dimensional (1-D) structure using a rotational invariant value of impedance (Zssq). Before the application to the field data, we checked that a stitched 1-D model, used as a quasi 3-D structure, is valid to understand regional subsurface features in a geothermal field based on numerical simulations, although the detailed resistivity anomalies could not be resolved. In the preliminary quasi-3D structure, we found that low resistivity features are obvious along fractures and lineaments. Some of them are located close to the manifestations. Our result possibly can indicate fracture zones with the deep and high-temperature gas/water upwelling.