R003-08
Zoom meeting A ：11/3 AM1 (9:00-10:30)
9:15〜9:30

Three-dimensional electrical resistivity structure beneath the back-arc side of the southern Tohoku region

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M7-class historical earthquakes have occurred beneath the back-arc side of the southern Tohoku region (e.g., the 1804 Kisakata earthquake, the 1894 Shonai earthquake). Since aqueous fluids can significantly influence subsurface rocks' mechanical properties, including the shear fracture strength of seismogenic faults, imaging subsurface fluid distribution is essential to understand the earthquake generation process. In addition, there are some volcanoes (e.g., Chokaisan, Gassan, and Zaosan) in the back-arc and backbone range area of the southern Tohoku region. It is considered that the volcanic activities of the area are also related to the subsurface fluids. An effective approach for imaging the subsurface fluid distribution is conducting an electromagnetic induction survey that delineates the electrical resistivity structure, which is sensitive to the interconnected fluid in subsurface rocks. Thus, to investigate the relationship between the subsurface fluid and the seismic and volcanic activities beneath the back-arc area of the southern Tohoku region, we carried out magnetotelluric surveys around the area and estimated a subsurface electrical resistivity structure. To reveal resistivity structure, we first estimated the impedance tensor, the vertical magnetic transfer function, and the inter-station horizontal magnetic transfer function using the BIRRP code (Chave and Thomson, 2004). The estimated response functions show characteristic features that seem to be related to the volcanos and faults around the study area, although the response functions appear to be strongly affected by the difference of the near-surface resistivity between relatively resistive mountainous areas and the conductive plains and basins. We then performed inversion to image the three-dimensional electrical resistivity structure of the survey area from the estimated response functions. In the inversion, we used the three-dimensional magnetotelluric inversion code FEMTIC (Usui 2015; Usui et al. 2017) and incorporated both terrain undulation and land-sea distribution into a computational mesh. This presentation shows a preliminary result of the three-dimensional inversion analysis.