

## **A three-dimensional crustal electrical resistivity model of the seismic swarm area stimulated after The 2011 Tohoku-Oki Great Earthquake beneath Aizu-Yonezawa-Azuma district, NE Japan**

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### **SUMMARY**

We have integrated broadband MT data observed in the southern Tohoku district, NE Japan, and have analyzed the crustal electrical resistivity structure. However, the integrated dataset has an observation gap from Aizu-Yonezawa region to Azuma Volcano. Aizu-Yonezawa region is where seismic swarms turned active after the 2011 Tohoku-Oki Great Earthquake in the upper crust, and hypocenter migration has been confirmed in this swarm area (Okada et al, 2015). Moreover, deep low-frequency earthquakes (DLFEs) have occurred in the lower crust to the uppermost mantle (20-40 km depth) beneath Azuma Volcano. These results indicate fluid reservoirs and transportation beneath the region. In this study, we added new data observed at 18 broadband MT stations around Azuma Volcano (Ichiki et al., 2021) and reanalyzed the crustal electrical resistivity model using the inversion code with tetrahedral element finite element method (Usui, 2015).

The updated model indicates the swarms are located at the boundary of the resistive and conductive zone. The model shows a prominent conductive body at the depths of 15-40 km beneath the region, at the boundary of which DLFEs occur. Furthermore, the S-wave reflectors have been identified just above this conductive body (Suzuki, 2018 Master Thesis, Tohoku University), which suggests dehydrated fluid from deep magma reservoir moves to shallow areas and swarms occur at the boundary of the resistive and conductive zone. The updated model reveals a continuous vertical conductor from the lower to upper crust beneath Azuma Volcano, and the conductor probably connects the conductive zone beneath Aizu-Yonezawa region. The vertically continuous conductor beneath Azuma Volcano was not detected by Ichiki et al. (2021).

We are currently estimating water content using the confidence interval of the resistivity value of the conductive body in the lower crust and plan to constrain the magmatic conditions further using both resistivity and seismic velocity structures.

**Keywords:** Resistivity, Seismicity, Melt, Water Content

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