

## Wideband magnetotelluric exploration of Miyakejima Volcano

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Since the eruption in 2000, Miyakejima volcano is continuously degassing the SO<sub>2</sub> from the summit. One of the possible causes of the large amount of degassing might be the loss of the ground water layer under the volcano, in particular in the summit region. In an island, we usually expect the ground water distribution as Geiben-Hertzberg lens, where invaded seawater lens is overlain by fresh water lens. Such a distribution of groundwater will be best imaged by electromagnetism, like magnetotellurics.

To check this model, we carried out wide-band (300Hz to 1/2000Hz) magnetotelluric measurements since December 2002. We deployed 9 magnetotelluric sites along a SW-NE profile. Unfortunately we do not have sites near the crater, because of the difficult access. A two-dimensional inversion results showed distribution of conductors, which corresponds to the ground water. The top of the conductor is almost at the sea level throughout the profile.

However the thickness of the conductor varies with locations. In the SW and NE ends, the thickness of the conductor is 3km and 2km respectively, but towards the crater pit, the bottom of the conductor shallows. This implies the loss of the ground water towards the center of the volcano.

We need more magnetotelluric observations in the peak area and also two-dimensional coverage of the island to fully confirm the groundwater loss model.