# Conductive Zones in Volcanic Edifices and their Relation to Self-Potential data

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According to the previous electric or electromagnetic surveys, conductive zones (less than 10 ohm-m) frequently exist within many volcanic edifices. These conductive zones are usually interpreted as hydrothermal system. However geothermal surveys, whose target is not active volcanoes, have showed that conductive zone is a cap layer above the hydrothermal reservoir, and altered clay (smectite), is the main cause of low resitivity [e.g., Ussher et al., 2000]. It is important to investigate whether or not the conductive zone in volcanic edifices represent the clay cap, because corresponding permeability is completely different. Altered clay implies impermeable structure, while fluids probably exist in permeable structure. Permeability structure possibly relates to the volcanic activities, such as tremor, phreatic eruption, gas emission, and ground deformation. Since there have been few drilling into active volcanoes, the interpretation of the conductive zone is not established.

We will present the resistivity and self-potential profiles across the edifices of Nasu, Iwate, Iwaki, and Nantai volcanoes, and investigate the relationship between these two kinds of profiles. Conductive zone and SP data have a good correlation, and both may reflect the same structure in volcano. By using the theory of self-potential and location of surface geothermal activities, we will argue the image of conductive zone in volcanic edifices.