Shallow resistivity structure around earthquake swarm area deduced from dense AMT/MT observations

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Investigation of the electrical structure around a seismic active region is an important issue to discuss what control the seismicity. The southeastern flank of the Ontake volcano, which is located in central Japan, is one of the most interesting fields to be explored. In this area, earthquake swarm activity has been continuously observed since 1976. Additionally, a large earthquake with the depth about 2km and a magnitude of 6.8 occurred in 1984 in the swarm region. Recent study of seismic tomography investigated by dense seismic network (Noda et al., 2007) found out low velocity anomalies beneath earthquake clusters. In order to delineate the detailed physical properties of the upper crust surrounding the seismogenic zone compared with fine velocity structure, we plan to image lateral heterogeneity of subsurface electrical structure. Here, we report on new audio-frequency magnetotelluric (AMT) data acquired in 2008 at 34 sites. Our data are complemented with 34 broad-band MT sites of previous investigations (Kasaya et al., 2002; Iio et al., 2000).

As a consequence of the preliminary two-dimensional inversion, conductive zone was found along the fault plane of the 1984 Earthquake. This electrical image was consistent, in principle, with previous broad-band MT studies. Additionally, several patches of conductor were also revealed at shallower depths. In this presentation, we will introduce dense AMT/MT data and discuss lateral heterogeneity on electrical resistivity comparing with the seismicity and velocity structure.