

## Hydrothermal system beneath Usu volcano inferred from self-potential survey

# Hideaki Hase[1]; Takeshi Hashimoto[2]; Yasunori Nishida[3]; Mitsuru Utsugi[4]; Hiroyuki Inoue[5]; Mizue Saba[6]

[1] ISV, Hokkaido Univ.; [2] Inst. Seismol. Volcanol., Hokkaido Univ.; [3] Inst. Seis. Volc. Center, Hokkaido Univ.; [4] Kyoto Univ.; [5] AVL, Kyoto Univ.; [6] none

We conducted self-potential (SP) surveys on Usu volcano since July to December 2006. The compiled SP map reveals positive anomalies around Ko-Usu lava dome and at the foot of the volcano, and a negative anomaly on the top of O-Usu lava dome. The SP profile on the summit caldera shows the same pattern of 1985's. However, the peak-to-peak amplitude of the SP value is different: the 1985's of that shows 1000 mV while the 2006's shows 1400 mV. Topographic effect is clearly shown along the southwestern foot of the volcano, in which coefficient is about -2.5 mV/m. The SP profile corrected of the topographic effect reveals a large and extensive positive anomaly over +600mV and several local positive anomalies over +1000 mV on the summit caldera. The corrected SP also reveals that a positive anomaly at the south part of Ko-Usu lava dome and a negative anomaly at the O-Usu lava dome do not exist. The revealed positive SP anomalies are likely to be affected by an extensive altered layer, located beneath the summit caldera. The largest positive anomaly is shown on the ridge of Usu-Shinzan cryptodome after topographic correction. This anomaly is not regarded to be formed by hydrothermal upwelling, because any indications of fumarolic and geothermal activities have not been observed on the ridge of the volcano. The SP anomaly may be affected by intruded material into the volcano. The SP amplitude in the northwestern part of Nishiyama is very small in spite of rugged topography. An extensive low resistivity layer (less than 10 ohm-m) located in the shallow part in the northwestern of Nishiyama probably shields the SP variation.