Hydrothermal system beneath Nabeyama-Myoban hotspring area inferred from self-potential profile

Hideaki Hase[1]

[1] ISV, Hokkaido Univ.

Beppu city is one of most famous hot spring area in Japan, having 2,800 sources of spring and 50,000 ton discharges. We conducted self-potential (SP) survey on Nabeyama and Myoban, one of the sources of hot spring area in Beppu. In many cases, SP profiles on mountainous area show a liner correlation with elevation because of simple water flow into the mountain, however, the observed SP profile on Nabeyama and Myoban area does not show the significant correlation. Additionally, we can not confirm any specific positive SP anomalies there in spite of located in sources of hot spring area. The most characteristic SP profile on this area is scattered variation about 20 mV in whole area. In this study, we conducted 3D numerical simulation of water flow and SP beneath the Nabeyama-Myoban area to evaluate subsurface hydrothermal water flow is existed or not. The grid setting is 56 $*$56 $*$24, minimum spacing is 50m and the spacing is getting larger leaving away from the center grid. The result of the simulations imply that high resistivity structure may create the scatter SP profile and a narrow conductor such as altered conduit or hydrothermal upwelling itself can make local positive SP anomaly on the Nabeyama area.