

Visualization of deep-seated fluid flow in Tokusa Basin, Yamaguchi Prefecture

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It is known that highly saline fluids spout out in spite of inland area in Japan (Sakai et al. 1978). These fluids spout out not only at the surface of the ground surface but also at the flowing borehole. However, the erupted region of ascending fluid from flowing borehole and its relationship to the geological structure is not identified. Electromagnetic surveys applying Controlled Source Audio-frequency Magneto-Telluric Method was carried out in the Tokusa basin, Yamaguchi Prefecture to obtain the two dimensional distribution of resistivity to clarify the geological structure and the distribution of deep-seated fluid.

The study area is consisted of the Late Cretaceous welded tuff, rhyolitic lava, and the Holocene sediments. Low resistivity zone continuously is distributed along the Tokusa-Jifuku fault (Sagawa et al, 2008) in bedrock more than 2.5km long and is distributed in north side of the fault in sediments like a tongue shape. Resistivity of erupted highly saline water corresponds to that obtained by CSAMT. Groundwater of the shallow wells drilled in the sediments shows the NaCl type. Therefore, low resistivity zone in the sediments corresponds to the highly saline water diluted by surface groundwater. As a result, deep-seated fluid in the Tokusa basin rises along the Tokusa-Jifuku fault in the basement rock and then flows to river subjected to the dilution by surface groundwater.

Keywords: Deep-seated fluid, CSAMT method, Tokusa-Jifuku fault, Groundwater flow

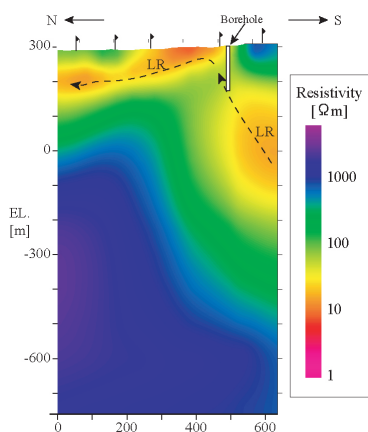


Fig.1 The resistivity profile by the CSAMT survey.