

Study of regional groundwater flow system by using self-potential (SP) method

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The self-potential method (SP method) is one of the geophysical explorations technique originally used to exploration for the mineral deposit. Recently, this technique has been applied for understanding the fluid flow in the volcanic area. In this application the behavior of groundwater flow is treated as a noise.

It is difficult to find out the cause of generation of self-potential because the generation mechanism of self-potential is very complex, and there exists various factors affecting the SP measurement on the ground.

However, in case of the self-potential caused by the groundwater flow, It is mainly caused by the streaming potential (Ishido and Mizutani,1981) represented by the electrokinetic phenomena. Because, The streaming potential is a function of the groundwater potential and the resistivity, it is relatively easy to understand system the cause of SP generation.

This study has aimed to establish the SP techniques to understand the groundwater flow either by the hydrological-hydrogeological approach or by the geophysical approach.

The selected study site to use the SP method is Eino-o, Shiranui town, Kumamoto, where regional groundwater flow system in the study catchment has been cleaned by this method.

The result shows that the proposed SP method is suitable to understand the regional groundwater flow, and it could be the useful investigation methods for groundwater.

In the presentation, we will show self-potential numeric modeling using the result of the groundwater flow simulation for a simple mountain slope.