Preliminary Study of Scale Effect on Investigating Unknown Object Using Borehole Electrical Resistivity Tomography

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An in-situ experiment for investigating ground improvement using borehole electrical resistivity tomography method, also called BHERT, was performed and proposed at JPGU-2016 as well last year. In the study the simulated results from BHERT presented the roughly three dimensional distributing of the grouted materials of the ground improvement in deep underground soil layers. Despite the clear image being obtained, the operating parameters of BHERT and interpreting method make influence on the result, especially size effect. To clarify more details of the mentioned effect for further adoption, an in-situ with smaller size experiment was performed. A series tests with varies soil materials prepared and objects with different shapes buried inside was performed for setting up a standard reference. The result shows that a correcting factor is existing between object size, field size, and electrical parameters. The factors can be normalized to be unitless.

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