



A Comparative Study on Factors Affecting Thermal Response Test Analysis

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Accurately estimating thermal parameters of ground is important for the sustainable and efficient operation of shallow geothermal systems. A thermal response test (TRT) has been widely performed for the thermal characterization. In this study, four cases (three field tests and one laboratory test) were analyzed using four analytical models with different assumptions of heat source to investigate the influence of three factors (starting time, test duration, and data acquisition interval (DAI)) related to the experimental condition. To compare effects of each factor, the base case was established and various comparison scenarios were generated by varying the factors within specific ranges. The influence degree was demonstrated in the order of starting time, test duration, and DAI, and in particular, the starting time significantly contributed to the thermal conductivity change up to 27.18%. On the other hand, the test duration and the DAI, the other two factors, had maximum impacts of 7.32% and 1.07%. As a result, it was confirmed that the factors should be taken into account when setting the experimental condition of TRT.

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