



Research

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Reduction of thermal resistance by air injection into boreholes

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The design of ground heat exchanger (GHE) systems requires knowledge of ground thermal properties, e.g. ground thermal conductivity and thermal resistance of the borehole. The main purpose of this study was to increase the heat transfer by forced convection in the borehole. In order to achieve this goal air bubbles were injected at the bottom of a borehole. Two thermal response tests (TRT) were carried on the same borehole, before and after the injection of air bubbles. It was found that the thermal resistance of borehole was reduced by 27.65%. The effective thermal conductivity was also changed and increased by 27.71% because the injected air bubbles caused convection in the groundwater surrounding the borehole

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