

# **Impact of multi variables of aquifer properties on groundwater flow and heat transport in heterogeneous porous media**

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## **Abstract**

The behavior of flow and heat transport in the aquifer is strongly influenced by spatial distributions of hydrogeological properties such as hydraulic and thermal conductivity. Most previous studies on groundwater focused on homogeneous and isotropic hydrogeologic settings to simulate groundwater heat transport. Taking the advantages of VSAFT2 - iTOUGH2 and overcoming the list of limitations above, this study evaluates full and comprehensive critical parameters on flow and heat transport in heterogeneous porous media and a two-dimensional synthetic case. In detail, an attractive point of this study is to be used the stochastic inversion to estimate parameters inversely. The preliminary results show that the comparison between the observed and simulated heads is a high agreement reached 0.99 with a synthetic case. Thus, our approach can accurately characterize an aquifer's properties such as hydraulic conductivity. With an insight view of this aspect, we are going to evaluate thermal conductivity and capacity in a couple of modeling with flow and heat transport processes. It is an attractive approach to be expected that the characterization of aquifer structure is captured accurately based on the response information of aquifer properties, especially hydraulic conductivity and thermal conductivity.

**Keywords:** Flow and heat transport, hydraulic conductivity, thermal conductivity, temperature, and VSAFT2 - iTOUGH2.