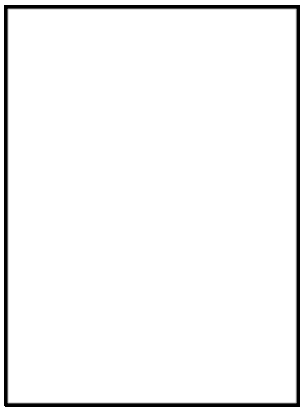
Finite-difference model of two dimensional, single-, and two-phase heat transport in a porous medium - version I

Dept. of the Interior, Geological Survey - Finite difference method



Description: -
-
Geothermal resources -- Mathematical models.
Heat -- Transmission -- Mathematical models.Finite-difference model of two dimensional, single-, and two-phase heat transport in a porous medium - version I
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Open-file report (Geological Survey (U.S.)) -- 77-234.
Open-file report - U.S. Geological Survey -- 77-234.Finite-difference model of two dimensional, single-, and two-phase heat transport in a porous medium - version I
Notes: Bibliography: p. 52-53.
This edition was published in 1977

Tags: #The #United #States #Geological #Survey: #HYDROTHERM

Three

A general mass-conservative numerical solution for the unsaturated flow equation. Version 3 included the UNSATCHEM module Suarez and Šimůnek, 1997 for simulating carbon dioxide transport as well as the multi-component transport of major ions. In addition the thermohydraulic conditions inside the heat exchanger can be determined.

Hydrus (software)

This approach has not been previously fully considered, and in this study, we show that a detailed microporosity analysis is essential for further estimations of permeability of volcanic-hosted geothermal systems.

A modeling approach for analysis of coupled multiphase fluid flow, heat transfer, and deformation in fractured porous rock

Journal of Heat Transfer, 105, 1983, pp. Chemical equilibrium and kinetics are taken into account in the mass balance equation, which is able to quantitatively simulate fluid flow, solute transport and geo—chemical reaction in the operation of CO 2 geo-sequestration.

An extension of the thermodynamic domain of a geothermal reservoir simulator

The mesh generator may be used for defining very general domain geometries, and for discretizing the transport domain into an unstructured finite element mesh. The modeling of these and other such processes must take into account the geometry of the porous solid, which impedes the flow of the fluid through the medium. Heat and mass transfer in porous fuel cell electrodes.

Three

In addition, porosity and permeability depend on effective stress and correlations describing that dependence are incorporated into the simulator.

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This guarantees stability if an integration scheme with a stability region that includes parts of the imaginary axis, such as the fourth order Runge-Kutta method, is used. First results are compared to experiments with cross flow and counter flow heat exchangers for single-phase flow and with an electrical evaporator for boiling conditions. At the top, there is a zone containing only water vapour.

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Eric Kalu, Numerical Methods with Applications, 2008. TOUGH2—a general purpose numerical simulator for multiphase fluid and heat flow. This work was funded in part by MITACS, and I thank the MITACS Mathematical Modeling and Scientific Computation group, in particular Dr.

Finite

For example, Caillabet et al. Modern computers can perform these computations efficiently which, along with their relative ease of implementation, has led to the widespread use of FDM in modern numerical analysis.

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