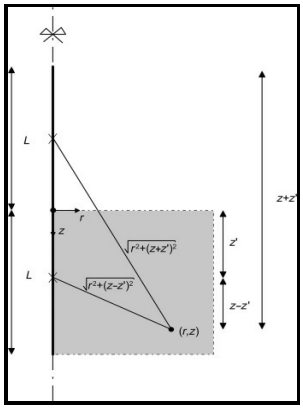
Finite-difference model of two dimensional, single-, and two-phase heat transport in a porous medium - version I

Dept. of the Interior, Geological Survey - An extension of the thermodynamic domain of a geothermal reservoir simulator



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In Chapter 5, we have presented and solved a problem which has so far not been considered in the literature.

Three

The performance of SCR-AMG is affected less by anisotropy with a slight increase in the number of time steps factor of 1.

Porous media simplified simulation of single

However, time steps which are too large may create instabilities and affect the data quality. Finally, the work in this thesis has considered the steady-state condensation problem. These methods use algebraic multigrid AMG to solve the linear systems in every Newton step.

Finite difference method

Further, the outer solution is expected to be valid throughout the domain, except only near the lower boundary. The model encompasses: 1 local thermal non-equilibrium to formulate the convective heat exchange between rock matrix and heat transfer fluid in the reservoir, 2 sub-modules describing temperature- and pressure-dependent thermophysical properties of water, and 3 a thermo-poroelastic model, which is used to calculate the effective stress in the rock matrix and to determine the time-changing local porosity and permeability in the reservoir.

Porous media simplified simulation of single

The results indicate that cavities hinder water breakthrough due to storage effects, while water may quickly migrate through highly conductive

fractures. An iterative method is described which allows both the full and outer models of the two-phase zone to be coupled to the two single-phase zones, and computations are performed with realistic control parameters for the entire three-zone system. We selected a model discretization of 40 × 40 elements having a side length of 0.

Condensation in a porous medium

It is indicated that the geochemical reactions do not have significant impact on pore pressure, mean stress and temperature. Consider the configuration shown in Figure 2. Root water uptake can be simulated as a function of both water and salinity stress, and can be either compensated or uncompensated.

An extension of the thermodynamic domain of a geothermal reservoir simulator

For example, Lee et al.

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