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Earth Sciences : Hydrogeology

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Modeling Phenomena of Flow and Transport in Porous Media

- Presents a detailed analysis of the physics, chemistry and thermodynamic basis (and of the corresponding mathematical representations) of all phenomena and processes of flow and transport of mass and momentum and energy through porous/fractured media
- Provides the foundations of the continuum approach and to mathematical modeling at the microscopic and macroscopic levels of mass momentum and energy in single and multiphase flow and transport
- Allows readers to develop a thorough understanding of the coefficients appearing in models of transport in porous media; from the question of "what is a porous medium" to well-posed mathematical models
- Starting from first principles, it develops continuum mathematical

This book presents and discusses the construction of mathematical models that describe phenomena of flow and transport in porous media as encountered in civil and environmental engineering, petroleum and agricultural engineering, as well as chemical and geothermal engineering. The phenomena of transport of extensive quantities, like mass of fluid phases, mass of chemical species dissolved in fluid phases, momentum and energy of the solid matrix and of fluid phases occupying the void space of porous medium domains are encountered in all these disciplines. The book, which can also serve as a text for courses on modeling in these disciplines, starts from first principles and focuses on the construction of well-posed mathematical models that describe all these transport phenomena.

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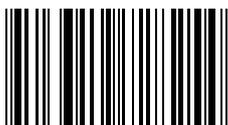
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