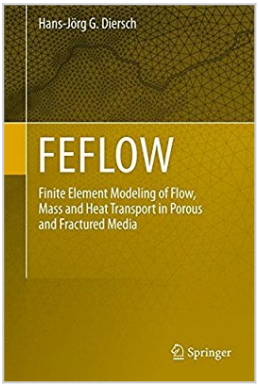

FEFLOW: Finite Element Modeling of Flow, Mass and Heat Transport in Porous and Fractured Media

By Hans-Jörg G. Diersch

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FEFLOW is an acronym of *Finite Element subsurface FLOW simulation system* and solves the governing flow, mass and heat transport equations in porous and fractured media by a multidimensional finite element method for complex geometric and parametric situations including variable fluid density, variable saturation, free surface(s), multispecies reaction kinetics, non-isothermal flow and multidiffusive effects. FEFLOW comprises theoretical work, modeling experiences and simulation practice from a period of about 40 years. In this light, the main objective of the present book is to share this achieved level of modeling with all required *details* of the physical and numerical background with the reader. The book is intended to put advanced theoretical and numerical methods into the hands of modeling practitioners and scientists. It starts with a more general theory for all relevant flow and transport phenomena on the basis of the continuum approach, *systematically* develops the basic framework for important classes of problems (e.g., multiphase/multispecies non-isothermal flow and transport phenomena, discrete features, aquifer-averaged equations, geothermal processes), introduces finite-element techniques for solving the basic balance equations, in detail discusses advanced numerical algorithms for the resulting nonlinear and linear problems and completes with a number of benchmarks, applications and exercises to illustrate the different types of problems and ways to tackle them successfully (e.g., flow and seepage problems, unsaturated-saturated flow, advective-diffusion transport, saltwater intrusion, geothermal and thermohaline flow).

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Editorial Review

About the Author

Hans-Jörg G. Diersch is the founder of the finite-element simulation system FEFLOW. He is a Professor for flow dynamics. His work encompasses a variety of theoretical and practical investigations with emphasis on variable-density flow, modeling of mass and heat transport processes as well as commercial software developments.

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Fernando Levering:

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