

Titles in Math Modeling and Numerical Analysis *from SIAM*

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Numerical Computing with Simulink, Volume I: Creating Simulations

Richard J. Gran

This book provides an introduction to computer-aided system design with Simulink®, a robust, accurate, and easily used simulation tool. The author takes readers on a tour of the Simulink environment that shows how to develop a system model and execute the design steps needed to make the model into a functioning design laboratory. Included along the way are the mathematics of systems: difference equations and z transforms, ordinary differential equations (both linear and nonlinear) and Laplace transforms, and numerical methods for solving differential equations.

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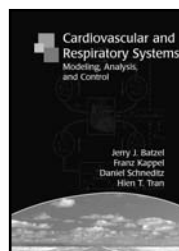
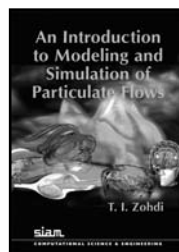


An Introduction to Modeling and Simulation of Particulate Flows

T. I. Zohdi

This introductory monograph focuses on basic models and physically based computational solution strategies for the direct and rapid simulation of flowing particulate media. Its emphasis is primarily on fluidized dry particulate flows in which there is no significant interstitial fluid, although fully coupled fluid-particle systems are discussed as well. An introduction to basic computational methods for ascertaining optical responses of particulate systems also is included.

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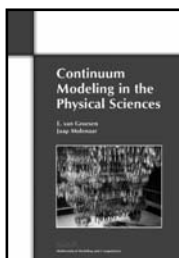


Continuum Modeling in the Physical Sciences

E. van Groesen and Jaap Molenaar

Mathematical modeling has expanded considerably over the last decades, making it impossible to cover all of its aspects in one course or textbook. This book provides an extensive exposition of the general principles and methods of this growing field with a focus on applications in the natural sciences. The authors present a thorough treatment of mathematical modeling from the elementary level to more advanced concepts.

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Zhangxin Chen

This book covers and expands upon material presented by the author at a CBMS-NSF Regional Conference during a ten-lecture series on multiphase flows in porous media and their simulation. It begins with an overview of classical reservoir engineering and basic reservoir simulation methods and then progresses through a discussion of types of flows—single-phase, two-phase, black oil (three-phase), single phase with multicomponents, compositional, and thermal.

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Jerry J. Batzel, Franz Kappel, Daniel Schneditz, and Hien T. Tran

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