



Numerical Time-Dependent Partial Differential Equations for Scientists and Engineers

By Moysey Brio

Oxford Elsevier LTD Okt 2010, 2010. Buch. Condition: Neu. Neuware - It is the first text that in addition to standard convergence theory treats other necessary ingredients for successful numerical simulations of physical systems encountered by every practitioner. The book is aimed at users with interests ranging from application modeling to numerical analysis and scientific software development. It is strongly influenced by the authors research in in space physics, electrical and optical engineering, applied mathematics, numerical analysis and professional software development. The material is based on a year-long graduate course taught at the University of Arizona since 1989. The book covers the first two-semester of a three semester series. The second semester is based on a semester-long project, while the third semester requirement consists of a particular methods course in specific disciplines like computational fluid dynamics, finite element method in mechanical engineering, computational physics, biology, chemistry, photonics, etc. The first three chapters focus on basic properties of partial differential equations, including analysis of the dispersion relation, symmetries, particular solutions and instabilities of the PDEs; methods of discretization and convergence theory for initial value problems. The goal is to progress from observations of simple numerical artifacts like diffusion, damping, dispersion, and...



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