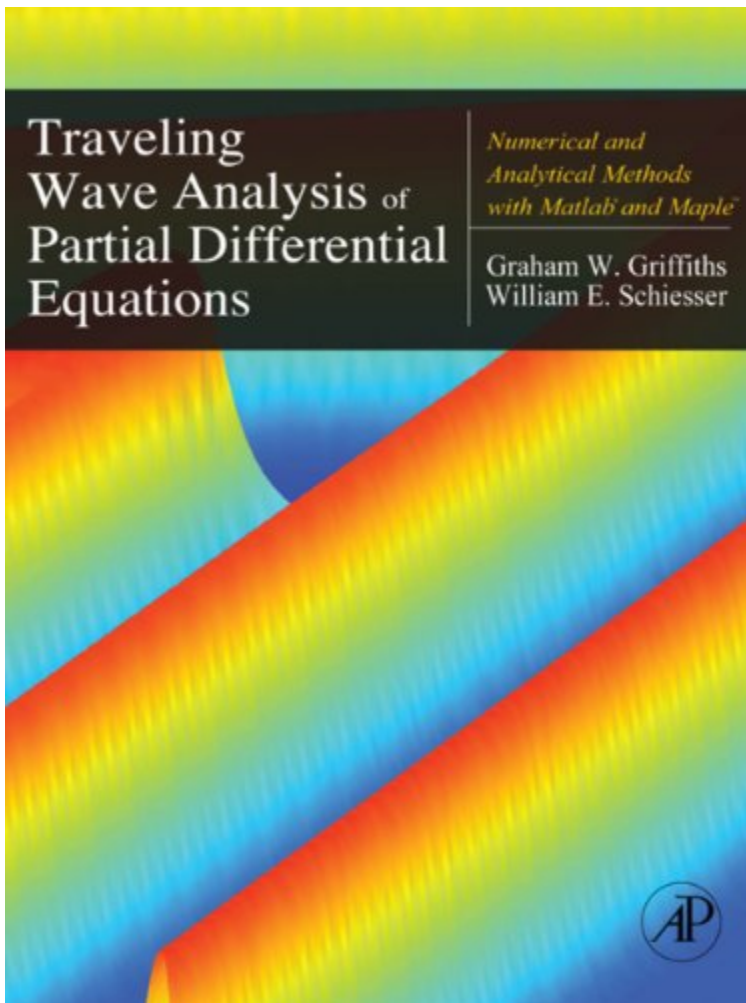


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Traveling Wave Analysis of Partial Differential Equations: Numerical and Analytical Methods with Matlab and Maple



Par Graham Griffiths, William E. Schiesser
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Dtails sur le produit Publi le: 2010-12-09
Sorti le: 2010-12-09
Format: Ebook
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Prsentation de l'diteurAlthough the Partial Differential Equations (PDE) models that are now studied are usually beyond traditional mathematical analysis, the numerical methods that are being developed and used require testing and validation. This is often done with PDEs that have known, exact, analytical solutions.

The development of analytical solutions is also an active area of research, with many advances being reported recently, particularly traveling wave solutions for nonlinear evolutionary PDEs. Thus, the current development of analytical solutions directly supports the development of numerical methods by providing a spectrum of test problems that can be used to evaluate numerical methods. This book surveys some of these new developments in analytical and numerical methods, and relates the two through a series of PDE

examples. The PDEs that have been selected are largely "named" since they carry the names of their original contributors. These names usually signify that the PDEs are widely recognized and used in many application areas. The authors intention is to provide a set of numerical and analytical methods based on the concept of a traveling wave, with a central feature of conversion of the PDEs to ODEs. The Matlab and Maple software will be available for download from this website shortly. www.pdecomp.net Includes a spectrum of applications in science, engineering, applied mathematics

Presents a combination of numerical and analytical methods
Provides transportable computer codes in Matlab and Maple

Revue de presse "This book surveys some of the new developments in analytical and numerical computer solution methods for partial differential equations with applications to physical, chemical, and biological problems. The development of analytical solutions directly supports the development of numerical methods by providing a spectrum of test problems that can be used to evaluate numerical methods."--Zentralblatt MATH 1228-1

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