

<<中国的工业与应用数学>>

图书基本信息

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前言

The China Society for Industrial and Applied Mathematics (CSIAM) had its 9th Annual Conference entitled “ Industrial and Applied Mathematics in China ” with 12 plenary talks from August 14 to 18, 2006 in Nanjing, China. Later on , in the 6th International Congress on Industrial and Applied Mathematics (ICIAM 2007) held from July 16 to 20 , 2007 in Zurich , Switzerland , CSIAM organized an embedded meeting with the same title on July 18 , 2007 , which consists of two two-hour sessions with six lectures. Since all these talks concern the topic “ Industrial and Applied Mathematics in China ” .we gather a large part of them in this volume for publication. We hope that the readers can get an impression on the present situation and trends of the industrial and applied mathematics in China from this volume and the researchers and graduate students in applied mathematics and in applied sciences can benefit from the mathematical models and methods with applications presented in this book. We would like to take this opportunity to give our sincere thanks to all the speakers and , in particular , to those who gave their contribution to this volume for their kind help and support.

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内容概要

This new volume introduces readers to the current topics of industrial and applied mathematics in China, with applications to material science, information science, mathematical finance and engineering. The authors utilize mathematics for the solution of problems. The purposes of the volume are to promote research in applied mathematics and computational science; further the application of mathematics to new methods and techniques useful in industry and science; and provide for the exchange of information between the mathematical, industrial, and scientific communities.

书籍目录

Preface Xiaoshan Gao, Ziming Li: Mechanized Methods for Differential and Difference Equations Song Jiang, Feng Xie, Jianwen Zhang: A Global Existence Result in Radiation Hydrodynamics Shi Jin: Recent Computational Methods for High Frequency Waves in Heterogeneous Media Ying Bao, Zhiming Ma, Yanhong Shang: Some Recent Results on Ranking Webpages and Websites Lifeng Chen, Shige Peng: Report on Testing and Finding the Generating Functions g of an Option Pricing Mechanism through Market Data Jun Hu, Zhongci Shi: Analysis of Nonconforming Rotated 1 Element for the Reissner-Mindlin Plate Problem Yongji Tan: Monitoring the Corrosion of the Blast Furnace by Perturbation Method Yong Xiao, Sufen Zhao, Xiaoping Wang: Numerical Study of Magnetic Properties of Nanowire Arrays Zongmin Wu: Generalized B-spline Xuan Zeng, Hengliang Zhu, Fan Yang, Jun Tao, Yi Wang, Jintao Xue: Mathematical Problems in System-on-Chip Design and Manufacture Weiwei Qi, Ming Chen, Huitao Zhang, Peng Zhang: A New Reconstruction Algorithm for Cone-beam CT with Unilateral Off-centered RT Multi-scan Tie Zhou, Jiantao Cheng, Ming Jiang: Bioluminescence Tomography Reconstruction by Radial Basis Function Collocation Method

章节摘录

We consider the compressible fluid dynamics with taking into account the radiation effect. First, we present the general model in radiation hydrodynamics which is the compressible Navier-Stokes equations coupled with the radiative transport equation with nonlocal terms and very difficult to solve both numerically and analytically. Practical simplified models are introduced in some physical regions. From the physical and numerical points of view, these models can approximate the general equations of radiation hydrodynamics very well in some particular physical situations. In particular, the Equilibrium Diffusion Approximation model and the Eddington Approximation or Diffusion Approximation model are mainly studied in the present paper. Then, we briefly review recent mathematical results on the equations of radiation hydrodynamics, in particular, on the simplified models. Some remarks on the non-local thermal equilibrium (non-LTE) case are also given. Finally, for a one-dimensional model in non-LTE of radiation hydrodynamics which describes almost isotropic interaction between a viscous heat-conducting gas and photons, we prove the global existence of a unique classical solution, provided that the initial data are suitably smooth and the heat-conductivity coefficient satisfies a physical growth condition with respect to the temperature.

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