

<<谱方法和高精度算法及其应用>>

图书基本信息

书名：<<谱方法和高精度算法及其应用>>

13位ISBN编号：9787030177223

10位ISBN编号：7030177223

出版时间：2006-12

出版时间：科学出版社发行部

作者：本社

页数：326

字数：399000

版权说明：本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问：<http://www.tushu007.com>

## <<谱方法和高精度算法及其应用>>

### 内容概要

《谱方法和高精度算法及其应用（英文）》是作者多年教学与科研工作的总结，曾经在香港中文大学，香港浸会大学，加拿大和中国科学院给研究生使用过。

主要介绍一些高精度的计算方法，以及相关的程序设计。

《谱方法和高精度算法及其应用（英文）》共分5章，第一章主要介绍准谱方法，第二章介绍时态离散和FFT，第三章介绍2D中的谱方法，第四章介绍迭代法和第五章主要是应用程序设计。

<<谱方法和高精度算法及其应用>>

书籍目录

Chapter 1 Preliminaries 1.1 Some basic ideas of spectral methods 1.2 Orthogonal polynomials 1.3 Chebyshev and Legendre polynomials 1.4 Jacobi polynomials and generalized Jacobi polynomials 1.5 Fast Fourier transform 1.6 Several popular time discretization methods 1.7 Iterative methods and preconditioning 1.8 Error estimates of polynomial approximations

Chapter 2 Spectral-Collocation Methods 2.1 Differentiation matrices for polynomial basis functions 2.2 Differentiation matrices for Fourier collocation methods 2.3 Eigenvalues of Chebyshev collocation operators 2.4 Chebyshev collocation method for two-point BVPs 2.5 Collocation method in the weak form and preconditioning

Chapter 3 Spectral-Galerkin Methods 3.1 General setup 3.2 Legendre-Galerkin method 3.3 Chebyshev-Galerkin method 3.4 Chebyshev-Legendre Galerkin method 3.5 Preconditioned iterative method 3.6 Spectral-Galerkin methods for higher-order equations 3.7 Error estimates

Chapter 4 Spectral Methods in Unbounded Domains 4.1 Hermite spectral methods 4.2 Laguerre spectral methods 4.3 Spectral methods using rational functions 4.4 Error estimates in unbounded domains

Chapter 5 Some applications in one space dimension 5.1 Pseudospectral methods for boundary layer problems 5.2 Pseudospectral methods for Fredholm integral equations 5.3 Chebyshev spectral methods for parabolic equations 5.4 Fourier spectral methods for the KdV equation 5.5 Fourier method and filters 5.6 Essentially non-oscillatory spectral schemes

Chapter 6 Spectral methods in Multi-dimensional Domains 6.1 Spectral-collocation methods in rectangular domains 6.2 Spectral-Galerkin methods in rectangular domains 6.3 Spectral-Galerkin methods in cylindrical domains 6.4 A fast Poisson Solver using finite differences

Chapter 7 Some applications in multi-dimensions 7.1 Spectral methods for wave equations 7.2 Laguerre-Hermite method for Schrödinger equations 7.3 Spectral approximation of the Stokes equations 7.4 Spectral-projection method for Navier-Stokes equations 7.5 Axisymmetric flows in a cylinder

Appendix A Some online software A.1 MATLAB Differentiation Matrix Suite A.2 PseudoPack

Bibliography

Index

## <<谱方法和高精度算法及其应用>>

### 编辑推荐

《谱方法和高精度算法及其应用（英文）》对一些新的科学计算法通过深入浅出的方法作了系统的介绍，并着重培养学生对程序设计的兴趣。

This book expands lectur enotes by the authors taught in the past few years in USA , Canada and China . The overall emphasis of these notes is to present basic algorithms together with some applications of spectral methods . The aim is to provide a sufficient background on the implementation and analysis of spectral and high-order methods so that the readers can approach the current research literature with the necessary tools and understanding . It is expected that this book will be a useful supplement for people studying spectral methods on their own . This book iS especially suited to students interested in high-order methods for PDEs . but it will appeal to numerical analysis and mathematically oriented students and researchers in engineering , physics , and related areas .

版权说明

本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问:<http://www.tushu007.com>