



Spectral Methods: Fundamentals in Single Domains (Scientific Computation)

By Claudio Canuto, M. Yousuff Hussaini, Alfio Quarteroni, Thomas A. Zang

[Download](#)[Read Online](#)

Spectral Methods: Fundamentals in Single Domains (Scientific Computation) By Claudio Canuto, M. Yousuff Hussaini, Alfio Quarteroni, Thomas A. Zang

Since the publication of "Spectral Methods in Fluid Dynamics" 1988, spectral methods have become firmly established as a mainstream tool for scientific and engineering computation. The authors of that book have incorporated into this new edition the many improvements in the algorithms and the theory of spectral methods that have been made since then. This latest book retains the tight integration between the theoretical and practical aspects of spectral methods, and the chapters are enhanced with material on the Galerkin with numerical integration version of spectral methods. The discussion of direct and iterative solution methods is also greatly expanded.

[Download Spectral Methods: Fundamentals in Single Domains \(...pdf](#)[Read Online Spectral Methods: Fundamentals in Single Domains ...pdf](#)

Spectral Methods: Fundamentals in Single Domains (Scientific Computation)

By Claudio Canuto, M. Yousuff Hussaini, Alfio Quarteroni, Thomas A. Zang

Spectral Methods: Fundamentals in Single Domains (Scientific Computation) By Claudio Canuto, M. Yousuff Hussaini, Alfio Quarteroni, Thomas A. Zang

Since the publication of "Spectral Methods in Fluid Dynamics" 1988, spectral methods have become firmly established as a mainstream tool for scientific and engineering computation. The authors of that book have incorporated into this new edition the many improvements in the algorithms and the theory of spectral methods that have been made since then. This latest book retains the tight integration between the theoretical and practical aspects of spectral methods, and the chapters are enhanced with material on the Galerkin with numerical integration version of spectral methods. The discussion of direct and iterative solution methods is also greatly expanded.

Spectral Methods: Fundamentals in Single Domains (Scientific Computation) By Claudio Canuto, M. Yousuff Hussaini, Alfio Quarteroni, Thomas A. Zang **Bibliography**

- Sales Rank: #3000443 in Books
- Published on: 2011-09-07
- Original language: English
- Number of items: 1
- Dimensions: 9.38" h x 1.25" w x 6.36" l, 2.38 pounds
- Binding: Hardcover
- 581 pages

 [Download Spectral Methods: Fundamentals in Single Domains \(...pdf](#)

 [Read Online Spectral Methods: Fundamentals in Single Domains ...pdf](#)

Download and Read Free Online Spectral Methods: Fundamentals in Single Domains (Scientific Computation) By Claudio Canuto, M. Yousuff Hussaini, Alfio Quarteroni, Thomas A. Zang

Editorial Review

Review

From the reviews:

"The main aim of the book is to discuss the approximations of solutions to ordinary and partial differential equations in single domains by expansions in smooth, global basis functions. ... furnishes a comprehensive discussion of the mathematical theory of spectral methods in single domains All chapters are enhanced with material on Galerkin method The discussion of direct and iterative solution methods is endowed with numerical examples that illustrate the key properties of various spectral approximations and solution algorithms." (Nina Shokina, Zentralblatt MATH, Vol. 1093 (19), 2006)

From the Back Cover

Since the publication of "Spectral Methods in Fluid Dynamics", spectral methods, particularly in their multidomain version, have become firmly established as a mainstream tool for scientific and engineering computation. While retaining the tight integration between the theoretical and practical aspects of spectral methods that was the hallmark of the earlier book, Canuto et al. now incorporate the many improvements in the algorithms and the theory of spectral methods that have been made since 1988. The initial treatment Fundamentals in Single Domains discusses the fundamentals of the approximation of solutions to ordinary and partial differential equations on single domains by expansions in smooth, global basis functions. The first half of the book provides the algorithmic details of orthogonal expansions, transform methods, spectral discretization of differential equations plus their boundary conditions, and solution of the discretized equations by direct and iterative methods. The second half furnishes a comprehensive discussion of the mathematical theory of spectral methods on single domains, including approximation theory, stability and convergence, and illustrative applications of the theory to model boundary-value problems. Both the algorithmic and theoretical discussions cover spectral methods on tensor-product domains, triangles and tetrahedra. All chapters are enhanced with material on the Galerkin with numerical integration version of spectral methods. The discussion of direct and iterative solution methods is greatly expanded as are the set of numerical examples that illustrate the key properties of the various types of spectral approximations and the solution algorithms.

A companion book "Evolution to Complex Geometries and Applications to Fluid Dynamics" contains an extensive survey of the essential algorithmic and theoretical aspects of spectral methods for complex geometries and provides detailed discussions of spectral algorithms for fluid dynamics in simple and complex geometries.

About the Author

The authors are among the leading researchers in the field of computational fluid dynamics and have pioneered and promoted the "Spectral Methods in Fluid Dynamics".

Users Review

From reader reviews:

Bruce Bracey:

Do you have favorite book? For those who have, what is your favorite's book? Guide is very important thing for us to understand everything in the world. Each e-book has different aim as well as goal; it means that reserve has different type. Some people sense enjoy to spend their time to read a book. They are really reading whatever they take because their hobby is reading a book. Why not the person who don't like reading a book? Sometime, man feel need book if they found difficult problem or maybe exercise. Well, probably you should have this Spectral Methods: Fundamentals in Single Domains (Scientific Computation).

Gayle Oconnell:

What do you in relation to book? It is not important along? Or just adding material when you need something to explain what you problem? How about your time? Or are you busy particular person? If you don't have spare time to try and do others business, it is make one feel bored faster. And you have spare time? What did you do? Every individual has many questions above. They need to answer that question because just their can do in which. It said that about reserve. Book is familiar on every person. Yes, it is suitable. Because start from on pre-school until university need this kind of Spectral Methods: Fundamentals in Single Domains (Scientific Computation) to read.

Martin Dowling:

Spent a free the perfect time to be fun activity to perform! A lot of people spent their free time with their family, or their friends. Usually they undertaking activity like watching television, likely to beach, or picnic inside park. They actually doing same task every week. Do you feel it? Do you need to something different to fill your free time/ holiday? Could possibly be reading a book may be option to fill your free time/ holiday. The first thing that you ask may be what kinds of book that you should read. If you want to attempt look for book, may be the reserve untitled Spectral Methods: Fundamentals in Single Domains (Scientific Computation) can be good book to read. May be it can be best activity to you.

Edward Franco:

Don't be worry in case you are afraid that this book may filled the space in your house, you could have it in e-book method, more simple and reachable. This particular Spectral Methods: Fundamentals in Single Domains (Scientific Computation) can give you a lot of friends because by you investigating this one book you have matter that they don't and make a person more like an interesting person. This book can be one of one step for you to get success. This book offer you information that probably your friend doesn't know, by knowing more than different make you to be great individuals. So , why hesitate? We need to have Spectral Methods: Fundamentals in Single Domains (Scientific Computation).

**Download and Read Online Spectral Methods: Fundamentals in
Single Domains (Scientific Computation) By Claudio Canuto, M.
Yousuff Hussaini, Alfio Quarteroni, Thomas A. Zang
#JP47KA6RXTB**

Read Spectral Methods: Fundamentals in Single Domains (Scientific Computation) By Claudio Canuto, M. Yousuff Hussaini, Alfio Quarteroni, Thomas A. Zang for online ebook

Spectral Methods: Fundamentals in Single Domains (Scientific Computation) By Claudio Canuto, M. Yousuff Hussaini, Alfio Quarteroni, Thomas A. Zang Free PDF d0wnl0ad, audio books, books to read, good books to read, cheap books, good books, online books, books online, book reviews epub, read books online, books to read online, online library, greatbooks to read, PDF best books to read, top books to read Spectral Methods: Fundamentals in Single Domains (Scientific Computation) By Claudio Canuto, M. Yousuff Hussaini, Alfio Quarteroni, Thomas A. Zang books to read online.

Online Spectral Methods: Fundamentals in Single Domains (Scientific Computation) By Claudio Canuto, M. Yousuff Hussaini, Alfio Quarteroni, Thomas A. Zang ebook PDF download

Spectral Methods: Fundamentals in Single Domains (Scientific Computation) By Claudio Canuto, M. Yousuff Hussaini, Alfio Quarteroni, Thomas A. Zang Doc

Spectral Methods: Fundamentals in Single Domains (Scientific Computation) By Claudio Canuto, M. Yousuff Hussaini, Alfio Quarteroni, Thomas A. Zang Mobipocket

Spectral Methods: Fundamentals in Single Domains (Scientific Computation) By Claudio Canuto, M. Yousuff Hussaini, Alfio Quarteroni, Thomas A. Zang EPub