terms of the standard basis vectors] as in (1.8.9)..." (p. 23) to cut back on the need to flip pages and look up equation numbers.

The book contains quite a few typographical errors, some of which have the potential to obscure somewhat the machinery that underlies solution steps. For example, the absence of the factor of x in the argument to the sine function in (1.8.31) makes the equation incorrect: $\int_0^L \big(\sqrt{\frac{2}{L}}\sin\frac{\pi k}{L}\big)^2 dx = 1,\ k = 1, 2, \ldots, K$ (p. 25). The next page has an analogous error. The reader would do well to keep the errata at cambridge.org/prosperetti handy (and perhaps to note errors in the errata, which says to replace "$|1 - z_1|$ by $|1 - z_1|$" on p. 440).

Also, some of the tables have poor typesetting. For example, Table 17.1 on p. 419 has some strange alignment, as well as inconsistent categories for the information in the second column. However, the careful reader will still distinguish among continuation of equations in the first column, notes pertaining to the first column, and notes pertaining to the second column.

The book does not contain exercises. Instead the website offers good collections of problems. The author could update these frequently without needing to write new editions of the text.

This book admirably lays down physical and mathematical groundwork, provides motivating examples, gives access to the relevant deep mathematics, and unifies components of many mathematical areas. While reading the book, I recalled one of my first students (in a precalculus class) getting a sharp understanding of the equivalence of two trig identities and exclaiming, "Oh, sweet Jesus!" This sophisticated topics text, which interweaves and connects subjects in a meaningful way, gives readers the satisfaction and the pleasure of putting two and two together.

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Spectral Methods: Algorithms, Analysis and Applications. *By Jie Shen, Tao Tang, and Li-Lian Wang*. Springer, New York, 2011. $124.00. xvi+470 pp., hardcover. ISBN 978-3-540-71040-0.

The analysis and application of spectral methods, emerging as a practical tool in computational science shortly after the introduction of the fast Fourier transform in 1965, has a history approaching half a century. Following the classic text by Gottlieb and Orszag in 1977 [1] and the comprehensive texts by Canuto et al in 1988 [2] and Boyd in 1989 [3], one can easily identify at least a dozen subsequent texts, covering a wide variety of subsequent developments and related topics.

It is therefore no easy task to write a new and comprehensive text on a topic as mature as that of spectral methods, and it requires that the author(s) make a choice between a broad but shallow coverage of a large number of topics or a more focused approach to deal with specific areas of the broader topic and discuss these with attention to detail. This text, originating from notes developed during a decade of teaching the topic in the U.S. and China, chooses the latter approach.

The text consists of nine main chapters, with the material naturally separating into two groups. The first four chapters discuss standard material, covering methods of weighted residuals, Fourier spectral methods, an introduction to classic orthogonal polynomials, and the development of polynomial spectral methods for two-point boundary value problems. This is fundamental material that can be found in existing texts [2, 4], although the chapter on orthogonal polynomials is more comprehensive than material found in most texts and may serve well as a reference on theoretical results. Although much of the material in this initial part of the text could form the basis for any class in spectral methods, the sparsity of examples may make the use of this text challenging for this purpose.

The remaining five chapters are driven by research interests of the authors, covering such topics as spectral methods for integral equations, methods for higher order differential equations, and methods for problems on unbounded domains. Much of this work, building directly on the many contributions of the authors, relies on the elegant use of classic orthogonal polynomials such as Jacobi, Laguerre, and Hermite polynomials to enable the development of accurate and robust spectral methods across a variety of problem areas. The remaining two chapters expand the focus to multi-dimensional problems, focusing on separable computational domains and utilizing clever constructions of basis functions to recover very sparse operators, and the application of such methods to a selection of examples of increasing complexity is discussed in the final chapter.

These nine chapters are complemented by four appendices, which cover an introduction to the essential mathematical knowledge, to Krylov methods, and to basic time integration methods. Each of the nine main chapters has a concluding problems section.

With the emphasis on the development and analysis of spectral methods for linear elliptic problems and a focus on accurate and efficient global spectral methods in single domains, the text is quite different from more recent texts, which tend to focus on multielement methods and time-dependent problems. In many ways, the emphasis on global expansions, special basis functions, and methods amendable to fast transforms is more true to the original pioneering work of the first half of the development of spectral methods than to what has been occupying researchers more recently. This observation should not be taken to imply that this is unimportant or without value, and the text does a very good job at outlining the importance of creativity and analysis in the development of modern computational techniques for complex applications.

However, this focus on globally defined spectral methods for problems in simple computational domains leaves out opportunities to discuss the many recent developments that have catapulted spectral methods into the mainstream as a robust computational tool, e.g., spectral element methods [5, 6, 7], spectral methods for conservation laws [4], and spectral methods on simplices [8, 9].

I read the text with enjoyment and expect it to be of great value as a reference, in particular for its careful presentation of key analytic results, and as a comprehensive introduction to the more detailed exposition of the authors' work in the second half of the text. However, I hesitate to recommend it as a general educational textbook unless it is complemented by other resources to ensure a more comprehensive and contemporary exposition of the state of spectral methods as a practical, robust, and accurate computational tool for solving complex problems in the sciences and engineering.

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Discrete Models of Financial Markets. *By Marek Capiński and Ekkehard Kopp*. Cambridge University Press, Cambridge, UK, 2012. $39.99. x+181 pp., softcover. ISBN 978-0-521-17572-2.

Discrete Models of Financial Markets is the first volume of the series "Mastering Mathematical Finance," and is an introductory text book on securities valuation in financial modeling. The book presents the basic concepts and the algebra of derivative valuation models based on the arbitrage-free