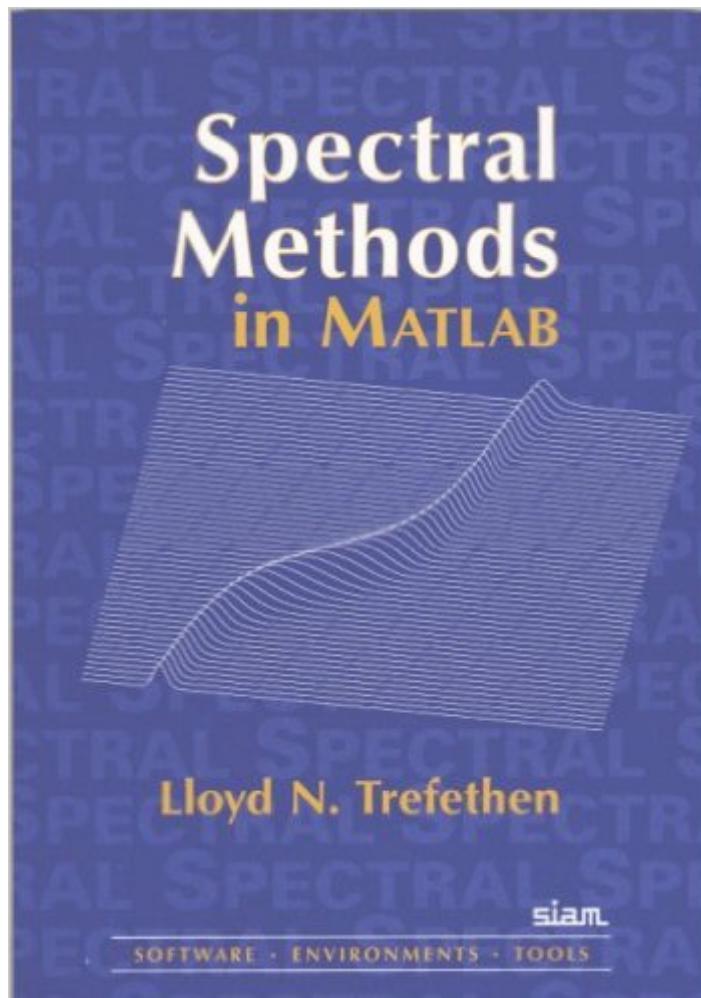


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# Spectral Methods In MATLAB (Software, Environments, Tools)



## Synopsis

This is the only book on spectral methods built around MATLAB programs. Along with finite differences and finite elements, spectral methods are one of the three main technologies for solving partial differential equations on computers. Since spectral methods involve significant linear algebra and graphics they are very suitable for the high level programming of MATLAB. This hands-on introduction is built around forty short and powerful MATLAB programs, which the reader can download from the World Wide Web. This book presents the key ideas along with many figures, examples, and short, elegant MATLAB programs for readers to adapt to their own needs. It covers ODE and PDE boundary value problems, eigenvalues and pseudospectra, linear and nonlinear waves, and numerical quadrature.

## Book Information

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## Customer Reviews

The author achieves the hard task of explaining the subject in a very simple and, at the same time, intelligent way. The MATLAB m-files are short, educative and full of useful tricks. The book is well motivated, focused in the essentials and easy to read. I am very fond of most of Prof. Trefethen writings and this book is no disappointment. It contrasts starkly with the lack of mathematical insight in most of the engineering collocation literature, but at the same time has a hands-on approach to the problems. This book should be useful to anybody interested in solving PDE in regular

geometries.

Trefethen's "Spectral Methods in Matlab" is the best introduction I've seen to spectral methods and I've recommended it to many students over the years. Trefethen has the uncanny ability to boil complicated ideas down to their essences and present them in a clear, logical progression.

If you are a numerical analyst, this is a nice book to have on your shelf. It's an extremely readable introduction, but you will need some background in linear algebra and differential equations to follow everything. Trefethen writes in a readable style that is not even remotely terse. The book gives the basics of what spectral methods are, why they are so useful, and some practical application notes. It's not rigorous, but citations are given for the curious reader to examine the theoretical foundations of spectral methods.

Exceptionally well written. The codes all work. Lots of thought provoking ideas in this book. I'm delighted with this book.

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