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A Practical Guide to Pseudospectral Methods

Partial differential equations arise in almost all areas of science, engineering, modeling, and forecasting. During the last two decades pseudospectral methods have emerged as successful alternatives to better known computational procedures, (e.g. finite difference and finite element methods of numerical solution), in several key application areas. These areas include computational fluid dynamics, wave motion, and weather forecasting. This book explains how, when and why this pseudospectral approach works. In order to make the subject accessible to students as well as researchers and engineers, the subject is presented using illustrations, examples, heuristic explanations, and algorithms rather than rigorous theoretical arguments. This book will be of interest to graduate students, scientists and engineers interested in applying pseudospectral methods to real problems.

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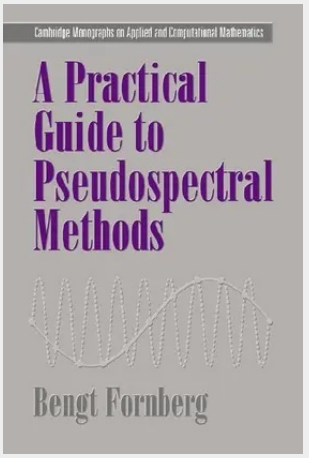

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