Chapter 11 is devoted to domain decomposition methods which, in the present context, are used to decouple the global nature of spectral methods into independent subdomain computations. Finally, the book concludes with several examples in Chapters 12–13.

The book concentrates mainly on the analysis of polynomial methods. This enables the author to expand the presentation of the corresponding material in the comprehensive treatment of spectral methods of [1, §§9–10]. The self-contained exposition of the material and an easygoing style of writing make this an excellent textbook to accompany a course on spectral methods. At the same time, it is a very well-written scholarly book that will serve both practitioners and experts. There is no doubt that *Polynomial Approximation of Differential Equations* is an important addition to the contemporary literature on spectral methods.

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1. C. Canuto, M. Y. Hussaini, A. Quarteroni, and T. Zang, *Spectral methods in fluid dynamics*, Springer Series in Computational Physics, New York, 1988.

17[65–06, 65Kxx, 65H10].—EUGENE L. ALLGOWER & KURT GEORG (Editors), *Computational Solutions of Nonlinear Systems of Equations*, Lectures in Appl. Math., Vol. 26, Amer. Math. Soc., Providence, RI, 1990, xx+762 pp., $23\frac{1}{2}$ cm. Price $235.00.

This volume contains articles presented at the 1988 AMS-SIAM Summer Seminar on "Computational Solution of Nonlinear Systems of Equations." There are a total of 40 papers covering a wide range of topics on the numerical solution of nonlinear equations. A collection of nonlinear test problems, compiled and edited by Jorge Moré, is also included.

In the area of continuation methods, the papers cover homotopy methods, PL algorithms, smooth penalty functions, and nonsingular polynomial continuation. Results of these continuation algorithms on variational problems, constrained optimization, two-point boundary value problems, and design problems are also included.

Newton and quasi-Newton methods are discussed for undetermined systems, for nonlinear convection diffusion equations, and for the linear complementarity problems. Duality algorithms and low-storage methods for unconstrained optimization are included.

Specific applications such as contaminant transport in porous media, dielectric spectroscopy, and collisional kinetic equations are also treated.

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