BOOK REVIEWS

ANALYSIS OF GLOBAL EXPANSION METHODS: WEAKLY ASYMPTOTICALLY DIAGONAL SYSTEMS, L. M. Delves *et al.*, Academic Press, London, July 1981. No. of pages: X+276. Price: £20·40 ($49·00). ISBN 0.12.208880.8.

The present book deals with the study of weakly asymptotically diagonal systems, which originated in an attempt to analyse the convergence of expansion methods for integral and differential equations by using 'global' types of interpolation functions such as Legendre, Chebyshev, and other orthogonal polynomials. The authors intend to provide supplementary work to the analysis of finite difference and element methods, the interpolation functions for which have in general 'local' support. Showing with many examples that the 'global' expansions using orthogonal polynomials yield much faster convergence than the finite element methods, the book discusses a method to predict the error by the 'global' method.

The book consists of three parts:

Theory of WAD (Weakly Asymptotically Diagonal) systems, Orthogonal Expansions, and Applications. The first chapter, entitled 'Introduction and Motivation', is readable and it is worthwhile to remind workers on finite element methods that there are many other methods which provide reasonably accurate results by considerably shorter computations, even though the area of applications of the present method is considerably restricted compared with finite element methods.

At a time when there are many published books on convergence analysis of 'local' methods such as finite element and difference, the present book on the analysis of 'global' methods is timely, and modernizes the classical expansion method by predicting the error at least asymptotically.

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IMPLEMENTATION OF COMPUTER PROCEDURES AND STRESS–STRAIN LAWS IN GEOTECHNICAL ENGINEERING, 2 volumes, edited by C. S. Desai and S. K. Saxena, Acorn Press (Box 4007, Duke Station, Durham, N.C. 27706), 1981, No. of pages: 704, Price: $48·50 (U.S.) (extra U.S. $12·00 for outside of U.S. and Canada); and EVALUATION OF CONSTITUTIVE PARAMETERS FOR GEOLOGICAL MATERIALS, edited by C. S. Desai, 1981, No. of pages: 151, Price: U.S. $15·00 (available from first author Department of Civil Engineering, University of Arizona, Tucson, AZ 85721).

The two volumes and the booklet constitute the proceedings of the Symposium on Implementation of Computer Procedures and Stress–Strain Laws in Geotechnical Engineering held at Chicago in August 1981. The main objective of this symposium was to address the question of application of available computer procedures and stress–strain laws; hence, the aspect of *theory to practice* was emphasized. As a result a number of papers related to practical applications and the current trends towards implementation of the procedures and constitutive laws of geologic materials are included.

The two-volume proceedings are divided in four parts: Static and dynamic soil–structure interaction; Underground structures and subsidence; Dams, slopes and seepage; and Constitutive Laws.

The papers related to soil–structure interaction consider topics such as non-linear behaviour of interfaces, offshore structures, piles, rafts, anchors, retaining walls and wave equation for pile driving. Mining subsidence, finite element simulation of underground construction, behaviour of tunnels in soft soil and tunnels in jointed rock are among the topics in the second part of the proceedings. The third part includes papers on the application of numerical procedures to the analysis and design of dams and slopes, boundary element method for seepage problems and use of micro-computers for seepage analysis. The last part includes development and use of a number of constitutive models based on plasticity theories for a variety of geological materials, and their implementation in boundary value problems. In recent years, the application of numerical procedures and computers for the solution of various geotechnical engineering problems has increased tremendously. These proceedings will be useful to the practitioner and the researcher,