REVIEWS AND DESCRIPTIONS OF TABLES AND BOOKS

The numbers in brackets are assigned according to the American Mathematical Society classification scheme. The 1991 Mathematics Subject Classification can be found in the annual subject index of *Mathematical Reviews* starting with the December 1990 issue.

1[65N30, 65N50, 65F10].—STEPHEN F. MCCORMICK, *Multilevel Adaptive Methods for Partial Differential Equations*, Frontiers in Applied Mathematics, Vol. 6, SIAM, Philadelphia, PA, 1989, ix + 162 pp., 23 cm. Price: Softcover $24.50.

This book provides an introduction to a class of multilevel methods for solving discretized partial differential equations. The discretization method used is the finite volume method (also known as box method). A brief introduction of this method is given in Chapter 2. Chapter 3 describes some basic concepts of the standard multigrid method. The major topic of the book, presented in Chapter 4, is how the multigrid method is used on a special locally refined grid. Ideas and techniques of the so-called FAC (fast adaptive composite grid) algorithms are discussed together with some preliminary theoretical analysis. The AFAC method, a parallelized version of FAC, is studied in Chapter 5.

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2[35J85, 73C50, 73E99, 73F99, 73K05, 65N30].—ROLAND GLOWINSKI & PATRICK LE TALLEC, *Augmented Lagrangian and Operator-Splitting Methods in Nonlinear Mechanics*, SIAM Studies in Appl. Math., Vol. 9, SIAM, Philadelphia, PA, 1989, x + 295 pp., $23\frac{1}{2}$ cm. Price $44.50.

Many of the most interesting problems of nonlinear mechanics involve constraints, either present because of the physics of the problems, or introduced artificially to provide a formulation convenient for computation. These include problems of incompressibility in nonlinear elasticity, unilateral constraints in contact problems, or general problems in elasticity, plasticity and elasto-viscoplasticity. In 1983 a popular collection of contributed papers appeared on the subject of augmented Lagrangian methods, edited by Michel Fortin and Roland Glowinski, which showed that these methods provided an attractive general approach to broad classes of constrained problems in nonlinear mechanics. The present book, written by two researchers who have contributed extensively to

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