Mathematics of Computation

Coden MCMPAF Volume 30, Number 134 Pages 199 — 381 April 1976

Published by the American Mathematical Society
Providence, Rhode Island

Editorial Committee

JAMES H. BRAMBLE, Chairman. Center for Applied Mathematics, 275 Olin Hall, Cornell Univ., Ithaca, NY 14853

WALTER GAUTSCHI, Computer Sciences Dept., Purdue Univ., Lafayette, IN 47907

ALSTON D. HOUSEHOLDER, Dept. of Mathematics, Ayres Hall, The Univ. of Tennessee, Knoxville, TN 37916

JOHN W. WRENCH, JR., Route 5, Box 237, Frederick, MD 21701

Technical Editor

CAROL A. HOLLAND, Center for Applied Mathematics, 275 Olin Hall, Cornell Univ., Ithaca, NY 14853

Board of Associate Editors

JAMES W. DANIEL, Dept. of Mathematics, Univ. ot Texas at Austin, Austin, TX 78712

DONALD GOLDFARB, Dept. of Computer Sciences, School of Engineering, The City College of the

City Univ. of New York, 139th Street & Convent Avenue, New York, NY 10031

EUGENE ISAACSON, Courant Institute of Mathematical Sciences, New York Univ., 251 Mercer Street, New York, NY 10012

HEINZ-OTTO KREISS, Computer Science Dept., Univ. of Uppsala, Uppsala, Sturegaten 4, Sweden YUDELL L. LUKE, Dept. of Mathematics, Univ. of Missouri at Kansas City, Kansas City, MO 64110

JAMES N. LYNESS, Argonne National Laboratory, 9700 South Cass Avenue, Argonne, IL 60439

MORRIS NEWMAN, Mathematics Division, National Bureau of Standards, Washington, DC 20234 BERESFORD PARLETT, Dept. of Computer Science, Univ. of California, Berkeley, CA 94720

LAWRENCE E. PAYNE, Dept. of Mathematics, Cornell Univ., Ithaca, NY 14853

PHILIP RABINOWITZ, Dept. of Applied Mathematics, The Weizmann Institute of Science, Rehovot, Israel

JOHN R. RICE, Division of Mathematical Sciences, Purdue Univ., Lafayette, IN 47907

DANIEL SHANKS, Mathematics Division, National Bureau of Standards, Washington, DC 20234

HANS J. STETTER, Institut für Numerische Mathematik, Technische Hochschule Wien, Karlsplatz 13, A-1040, Wien, Austria

VIDAR C. THOMÉE, Mathematics Dept., Chalmers Univ. of Technology, Göteborg, Sweden

Information for Subscribers

The journal is published quarterly in one volume per year, with issues numbered serially since Volume 1, Number 1. Subscription prices for Volume 30 (1976) are list \$48.00, institutional member \$32.00, individual AMS member \$13.00, member of CBMS organizations \$20.00. Back number prices per volume for Volumes 1–27 (1943–1973) are list \$36.00, AMS member \$27.00; Volumes 28–29 (1974–1975) are list \$54.00, AMS member \$40.50.

Volumes 1-29 (1943-1975) are available on 16 mm microfilm either as negatives or positives and may be mounted either on spools or in Eastman or 3M cartridges. Prices are \$360.00 for spools and \$375.00 for cartridges. Only current subscribers will be eligible to purchase back volumes on microfilm.

Unpublished Mathematical Tables

The editorial office of the journal maintains a repository of Unpublished Mathematical Tables (UMT). When a table is deposited in the UMT repository a brief summary of its contents is published in the section *Reviews and Descriptions of Tables and Books*. Upon request, the chairman of the editorial committee will supply copies of any table for a nominal cost per page.

Subscriptions and orders for publications of the American Mathematical Society should be addressed to American Mathematical Society, P. O. Box 1571, Annex Station, Providence, R.I. 02901. All orders must be accompanied by payment. Other correspondence should be addressed to P.O. Box 6248, Providence, R.I. 02940.

MATHEMATICS OF COMPUTATION

TABLE OF CONTENTS

APRIL 1976

A Stability Analysis for Perturbed Nonlinear Iterative Methods	
Paul T. Boggs & J. E. Dennis, Jr.	199
Error Analysis for a Stiff System Procedure Arthur David Snider	216
Numerical Applications of Reflection to Partial Differential Equations	
Arthur David Snider	220
An Analysis of the Finite Element Method Using Lagrange Multipliers for the	
Stationary Stokes EquationsRICHARD S. FALK	241
Higher Order Approximations to the Boundary Conditions for the Finite Ele-	
ment Method J. J. BLAIR	250
On the Evaluation of Some Integrals Occurring in Scattering Problems	
J. KADLEC	263
Finite-Difference Approximations to Singular Sturm-Liouville Eigenvalue Prob-	
lems G. W. REDDIEN	278
Stability of Multistep Methods for Delay Differential Equations	
Lawrence F. Wiederholt	283
Some Fourth Degree Integration Formulas for Simplexes A. H. Stroud	291
Converting Interpolation Series into Chebyshev Series by Recurrence Formulas	
Herbert E. Şalzer	295
Inequalities for Hypergeometric FunctionsR. G. BUSCHMAN	303
Characteristic m-Sequences MICHAEL WILLETT	306
A Computational Technique for Determining the Class Number of a Pure Cubic	
Field Pierre Barrucand, H. C. Williams & L. Baniuk	312
Factoring Multivariate Polynomials Over Algebraic Number Fields	
Paul S. Wang	324
Sharper Bounds for the Chebyshev Functions $\theta(x)$ and $\psi(x)$. II	
Lowell Schoenfeld	337
The Uniqueness of the Markoff Numbers GERHARD ROSENBERGER	361
A Uniform Distribution Question Related to Numerical Analysis	
Harald Niederreiter & Charles F. Osgood	366
REVIEWS AND DESCRIPTIONS OF TABLES AND BOOKS	371
Ansorge, Collatz, Hämmerlin & Törnig, Editors 16, Barrucand, Wil-	
liams & Baniuk 20, Bellman & Wing 12, Brenner, Thomée & Wahlbin	
9, Brent 21, Collatz & Meinardus, Editors 17, Demyanov & Malo-	
ZEMOV 11, HEWLETT PACKARD ADVANCED PRODUCTS DIVISION 23, LE-	
veque, Editor 22, Phillips & Taylor 10, Rivlin 13, Schrutka v. Rech-	
tenstamm 18, Shallit 19, Snell 14, Whiteman 15	
Table Errata	381
Choong, Daykin & Rathbone 521, Hill 522	

Information for Contributors

Manuscripts should be typewritten double-spaced in the format used by the journal. For journal abbreviations, see the latest *Mathematical Reviews* volume index. An author should submit the original and one copy of the manuscript and retain one copy. The author may suggest an appropriate editor for his paper. It is recommended that the author acquaint himself with the pertinent material contained in "A Manual for Authors of Mathematical Papers," which is available from the American Mathematical Society. All contributions intended for publication and all books for review should be addressed to James H. Bramble, Chairman, Editorial Committee, Mathematics of Computation, Center for Applied Mathematics, 275 Olin Hall, Cornell University, Ithaca, New York 14853. Institutions sponsoring research reported in the journal are assessed page and microfiche charges.

Each article submitted for publication must be accompanied by a brief and reasonably self-contained abstract, and by AMS (MOS) subject classification numbers. If a list of key words and phrases is included, it will be printed as a footnote on the first page. A list of the classification numbers may be found in the Index to Mathematical Reviews, Volume 39 (June 1970).

The research journals of the American Mathematical Society carry a page charge of \$40.00 per page to help defray the cost of publication. This amount is charged to the institution or to a contract supporting the research reported in the published paper. The publication charge policy of the United States Federal Council for Science and Technology (FCST) is reported on page 112 of the February, 1975 issue of the NOTICES of the American Mathematical Society. In no case is the author personally responsible for paying the page charge, nor is acceptance of the author's paper for publication dependent upon payment of the page charge.