

CONTENTS

VOLUME 1

Preface

1. POTENTIAL PROBLEMS

- Computation of Dielectric Permittivity from Experimental Measurements 1 - 3
G. T. Symm, National Physical Laboratory, Middlesex, U. K.
- A Legendre Polynomial BEM for Axisymmetric Coil Systems Including Iron 1 - 13
A. Zisserman & R. Saunders, Sunderland Polytechnic, and J. Caldwell, Newcastle-upon-Tyne Polytechnic, England
- Boundary Integral Equation Analysis of Blunt-Body Sampling 1 - 23
S. J. Dunnett & D. B. Ingham, University of Leeds and M. A. Kelmanson, University of Bradford, England
- Boundary Elements in Travelling Magnetic Field Problem 1 - 35
M. Ikeuchi, Okayama University of Science and M. Tanaka, Shinshu University, Japan
- Scale Effect in the BEM Solution of 2D Potential Problems 1 - 47
Jean-Louis Migeot, ULB - Continuum Mechanics Department, Bruxelles, Belgium
- Boundary Element Analysis of Galvanic Corrosion 1 - 63
S. Aoki, K. Kishimoto & M. Sakata, Tokyo Institute of Technology, Japan
- Boundary Elements for Cathodic Protection Problems 1 - 73
J. C. F. Telles, L. C. Wrobel, W. J. Mansur and J. P. S. Azevedo, COPPE/Federal University of Rio de Janeiro, Brazil

2. HEAT TRANSFER

- Conduction, Convection, and Radiation in Heat Transport by BEM 2 - 3
K. Onishi, Fukuoka University; N. Tosaka, Hihon University and M. Tanaka, Shinshu University, Japan
- More on Boundary Elements for Three-Dimensional Potential Problems 2 - 13
H. Jin and O. Tullberg, Chalmers University of Technology and Gothenburg Universities' Computing Centre, Sweden
- Application of the Boundary Element Method in Heat Conduction Problems 2 - 25
Jana Valcharova, National Research Institute for Machine Design, CSSR
- Applying BEM to Calculations of Temperature Fields in Bodies Containing Radiating Enclosures 2 - 35
R. Bialecki, Institute of Thermal Technology, Technical University of Gliwice, Poland

Numerical Study of Natural Convective Heat Transfer Along a Vertical Porous Plate <i>D. Lemonnier and D-K-Son, Laboratoire de Thermique de l'ENSMA, France</i>	2 - 51
Axi-Symmetric Eddy Current Problems by a Coupled FE-BE Method <i>S. Keran, Huazhong University of Science and Technology, Wuhan, China on leave at University of Toronto, Canada</i>	2 - 65
A Boundary Element Analysis of TEM Waveguides for Plasma Heating <i>T. Honma, Y. Tanaka, H. Watanabe and I. Kaji, Hokkaido University, Japan</i>	2 - 77
Mathematical Modelling of a Liquid Heat Exchanger <i>A. M. Ali, Yarmouk University, Irbid, Jordan</i>	2 - 89
Applying Green's Function for the Semi-Plane with Boundary Condition of the Third Kind in BEM <i>R. Bialecki, A. J. Nowak and R. Nahlik Institute of Thermal Technology, Technical University of Gliwice, Poland</i>	2 - 99
Thermal Fluid Flow with Velocity Evaluation Using Boundary Elements and Penalty Function Method <i>T. Kuroki and K. Onishi, Fukuoka University, Fukuoka, Japan and N. Tosaka, College of Industrial Technology, Nihon University, Japan</i>	2 - 107

3. TIME DEPENDENT PROBLEMS

A Boundary Element Investigation of 3-D Thermoelastic Problems in Transient Heat Conduction States <i>M. Tanaka, Shinshu University, Nagano, Japan and H. Togoh & M. Kikuta, Nippon Sheet Glass Co., Ltd., Japan</i>	3 - 3
Time-Domain Boundary-Element Method in Viscoelasticity with Application to a Spherical Cavity <i>J. P. Wolf and G. R. Darbre, Electrowatt Engineering Services Ltd., Switzerland</i>	3 - 19
Application of the Boundary Element Method to Three-Dimensional Problems of Non-Stationary Thermoelasticity <i>J. Masinda, National Research Institute for Machine Design, Czechoslovakia</i>	3 - 33
Groundwater Flow Analysis Under Space-Varying and Moving Recharges <i>K. Mizumura, Department of Civil Engineering, Kanazawa Institute of Technology</i>	3 - 43
Propagation of an Electromagnetic Field in a Conductive Half-Space <i>P. Joly, I. N. R. I. A. Domaine de Voluceau, France</i>	3 - 53
Viscoelastic Boundary Element Method for Analyzing Polymer Crazing as Quasifracture <i>B. N. Sun and C. C. Hsiao, University of Minnesota, Minnesota, U. S. A.</i>	3 - 69
The Solution of Parabolic and Hyperbolic Problems Using an Alternative Boundary Element Formulation <i>D. Nardini and C. A. Brebbia, Wessex Institute of Technology, Southampton, England</i>	3 - 87

4. PLATES AND SHELLS

- A Direct BEM for Elastic Plate-Structures Subjected to Arbitrary Loadings 4 - 3
M. Tanaka and K. Miyazaki, Shinshu University, Nagano, Japan
- An Alternative Analysis of Thin Elastic Plates with any Boundary Conditions, Using B. E. M. 4 - 17
F. Paris and S. Leon, University of Seville, Spain
- Elastic Buckling of Plates Using the Boundary Element Method 4 - 29
J. A. Costa Jr., and C. A. Brebbia University of Southampton and Wessex Institute of Technology, U. K.
- Nonlinear Analysis of Elastic Shallow Shells by Boundary Element Method 4 - 43
N. Tosaka and S. Miyake, College of Industrial Technology, Nihon University, Japan
- Fundamental Solutions and Boundary Integral Equations in the Bending Theory of Shallow Spherical Shells 4 - 53
A. D. Tepavitcharov, Higher Institute of Architecture and Civil Engineering, Sofia, Bulgaria
- A Boundary Superposition Element Method for the Kirchoff Plate Bending Problem 4 - 63
H. Werner and B. Protopsaltis, Technische Universitat Munchen, Institut fur Bauingenieurwesen, West Germany
- Numerical Solution of Plate Bending Problems Using the Boundary Element Method 4 - 81
R. Zotemantel, University of Dortmund, West Germany
- Cubic Spline Boundary Element Method for Circular Cylindrical Shells 4 - 93
L. M. Hadjиков, Institute of Mechanics and Biomechanics - BAS, Sofia, Bugaria;
S. Marginov, Centre for Transport Cybernetics and Automatization, Bulgaria and P. T. Bekyarova, ENERGOPROEKT, Sofia, Bugaria
- Integral Equation Solutions for Finite and Infinite Plate 4 - 103
J. Zhu, Chongqing Institute of Architecture and Engineering, China

5. WAVE PROPAGATION

- Modelling of Scattering Phenomena by a Hybrid Born Series and Boundary Integral Equation Method 5 - 3
G. T. Schuster, Aldridge Laboratory of Applied Geophysics, Columbia University, U. S. A.
- Numerical Simulation of Waves by Boundary Element Method 5 - 19
C. S. Lau, The City University, London, England
- A Hybrid Boundary Element Method for Ocean Wave Diffraction and Radiation Problems 5 - 37
T. Matsui, Nagoya University, Nagoya, Japan;
K. Kato, Toyota National Technical College, Japan and T. Shirai, Nippon Steel Corporation
- Space-Time Variational Formulas and Calculations of Retarded Potential 5 - 51
T. ha Duong, Centre de Mathematiques Appliquees, Ecole Polytechnique, Palaiseau, France

Nonlinear Water Waves Over Wavy Bed 5 - 61
K. Mizumura, Kanazawa Institute of Technology

6. DYNAMICS

Application of BE-FE Combined Method to Analysis of Dynamic Interactions Between Structures and Viscoelastic Soil 6 - 3
S. Kobayashi and T. Kawakami, Kyoto University, Japan

An Alternative BEM Formulation Applied to Membrane Vibrations 6 - 13
J. R. Hutchinson, University of California, U. S. A.

Boundary Integral Equation Methods in Three-Dimensional Elastodynamics 6 - 27
M. Kitahara, Tokai University, Shimizu, Japan and K. Nakagawa, Fuyo Data Processing and Systems Developments, Tokyo, Japan

The Edge-Function Method for Free Vibrations of Thin Orthotropic Plates 6 - 37
M. J. A. O'Callaghan and R. P. Studdert, University College, Cork, Ireland

Stochastic Dynamic Analysis of Elastic and Viscoelastic Systems by Means of the Boundary Element Method 6 - 53
T. Burczynski and A. John, Institute of Mechanics and Fundamentals of Machine Design, Silesian Technical University, Poland

Dynamic Response of Embedded Strip Foundations Subject to Obliquely Incident Waves 6 - 63
R. Abascal and J. Dominguez, University of Seville, Spain

Dynamic Analysis of Embedded Rigid Strip Footings by Time Domain Boundary Element Method 6 - 71
C. C. Spyarakos, West Virginia University, U. S. A. and D. E. Beskos, University of Patras, Patras, Greece

Free Bending Vibration and Buckling of Plates Under Uniform In-Plane Forces 6 - 79
B. A. Ovunc, University of Southwestern Louisiana, U. S. A.

Static and Dynamic Analysis of Plane Cable Nets Using the Boundary Element Method 6 - 89
J. Rakowski and R. Sygulski, Technical University, of Poznan, Poland

Free Vibrations of Cable Nets and Added Air Mass 6 - 99
R. Sygulski, Institute of Technology and Building Structures, Technical University of Poznan

An Alternative BEM Formulation Applied to Plate Vibrations 6 - 111
M. M. Akkari and J. R. Hutchinson, University of California, U. S. A.

On the Use of a 3-D Fundamental Solution for Axisymmetric Steady-State Dynamic Problems 6 - 127
Ma S. Gomez Lera and E. Alarcon, E. T. S. Ingenieros Industriales, Universidad Politecnica de Madrid and J. Dominguez, E. T. S. Ingenieros Industriales, Universidad de Sevilla, Spain

7. STRESS CONCENTRATION

- Singularity Modeling in Two- and Three-Dimensional Stress Intensity Factor Computation Using the Boundary Element Method 7 - 3
Y. Ezawa and N. Okamoto, Mechanical Engineering Research Laboratory, Hitachi, Japan
- Efficiency and Accuracy of the BEM and FEM for Stress Concentrations in Elastic Domain 7 - 13
V. F. Poterasu and N. Mihalache, Polytechnic Institute of Jassy, Romania
- Stress Analysis of the Compact Tension Specimen Using the Boundary Element Method 7 - 23
M. L. Luchi and S. Rizzuti, University of Calabria, Italy
- Comparison of Boundary Element and Finite Element Methods for Linear Stress Analysis - Technical Program Results 7 - 33
A. I. Wanderlingh, Applied Mechanics Group, Hamilton Standard, Division of United Technologies Corp., U. S. A.

VOLUME 2

8. FRACTURE MECHANICS

- Boundary Element Solution for the Torsion of Cracked Bars 8 - 3
J. Q. Zhen, C. A. Brebbia and Y. C. Zhang, Institute of Computational Mechanics, Southampton, and Southampton University, UK and Lanzhou University, China
- Study of Three-Dimensional Crack Front Shape by Boundary Elements Method 8 - 27
C. Adam and M. Afzali, LMT, Enset, Cachan, France and CETIM, France
- A New Integration Scheme in the B. E. M. to Fracture Mechanics Problems 8 - 47
J. Labeyrie, IFREMER Brest, France and M. Blanc, ENSAM Paris, France
- Application of Singular Integral Equations to Embedded Planar Crack Problems in Finite Body 8 - 57
G. H. Sohn and C. S. Hong, Korea Advanced Institute of Science and Technology, Seoul, Korea

9. FLUID FLOW

- A Hybrid 3D-Strip Method for Evaluating Surging Coefficients of Full-Shaped Ships 9 - 3
Ziong-Jian Wu, Shanghai Jiao-Tong University, China (Recently Brunel University, Middlesex, UK)
- Boundary Element Solutions of Convective Diffusion Compared with Finite Element and Weighted Finite Difference Method 9 - 13
M. Kanoh, Kyushu University; G. Aramaki, Saga University and T. Kuroki, Fukuoka University, Japan
- Analysis of Laminar Flows with Separation Using BEM 9 - 23
P. Skerget and A. Alujevic, University of Maribor, Yugoslavia and C. A. Brebbia, Department of Civil Engineering, University of Southampton, UK

Efficient Boundary Element Methods for Three-Dimensional Viscous Flows <i>F. K. Hebeker, Universitat-GHS, Paderborn, Federal Republic of Germany</i>	9 - 37
On the Boundary Element Method for Compressible Flow About Bodies <i>Y. Zuosheng, Nanjing Aeronautical Institute, China</i>	9 - 45
Nonlinear Water Waves Developed by an Accelerated Circular Cylinder <i>K. Mizumura, Kanazawa Institute of Technology, Japan</i>	9 - 49
On the Use of Boundary Element Methods for the Calculation of the Free and Translational Forced Oscillations of a Liquid in Axisymmetric Vessels <i>J. Siekmann and U. Schilling, Universitat-Gesamthochschule-Essen, West Germany</i>	9 - 61
Boundary Element Analysis of Steady Viscous Flows Based on P-U-V Formulation <i>N. Tosaka and K. Kakuda, College of Industrial Technology, Nihon University, Japan and K. Onishi, Fukuoka University, Fukuoka, Japan</i>	9 - 71
Integral Equation Solution of Viscous Flow Through a Fibrous Filter <i>M. L. Hildyard, D. B. Ingham and P. J. Heggs, University of Leeds, England and M. A. Kelmanson, University of Bradford, England</i>	9 - 81
Boundary Element Methods and Inhomogeneous Elliptic Differential Equations <i>J. C. Wu, Georgia Institute of Technology, Georgia, U. S. A.</i>	9 - 95

10. SOIL AND ROCK MECHANICS

A Novel Boundary Element Method for Thin Layers in Consolidation Analysis <i>G. Aramaki, Saga University, Japan</i>	10 - 3
Numerical Definition of Particle Angularity <i>M. R. M. Abwahhab and S. V. Ramaswamy, Yarmouk University, Irbid, Jordan</i>	10 - 13
Calculation of Free Surface Seepage Through Zoned Anisotropic Dams <i>Z. K. Lu, Guang Dong Hydroelectrical Engineering School, China; C. A. Brebbia, Wessex Institute of Technology & Computational Mechanics Centre, UK</i>	10 - 23
Application of Viscoelastic Combined Finite and Boundary Element Analysis to Geotechnical Engineering <i>T. Shinokawa, N. Kaneko and N. Yoshida, Sato Kogyo Co., Ltd., Japan and M. Kawahara, Chuo University, Japan</i>	10 - 37
A BIE Formulation for Consolidation Problems <i>N. Nishimura, Kyoto University, Kyoto, Japan</i>	10 - 47

11. COUPLING

Small Expert BEM. FEM System - K Y O K A I <i>K. Kobayashi, Y. Ohura and K. Onishi, Fukuoka University, Fukuoka, Japan</i>	11 - 3
---	--------

BEM Formulation Based on the Variational Principle and Coupling Analysis with FEM <i>M. Ohtsu, Kumamoto University, Japan</i>	11 - 13
Coupling of Finite and Boundary Element Solutions Using a Direct Minimization Approach <i>M. P. Kamat, Georgia Institute of Technology, Atlanta, U. S. A. and S. A. Brown, Virginia Polytechnic Institute and State University, U. S. A.</i>	11 - 23
12. MATHEMATICAL ASPECTS	
A Combination of Boundary Elements with Conformal Mapping Methods <i>R. Haas and H. Brauchli, Federal Institute of Technology, Zurich, Switzerland</i>	12 - 3
Mathematical Foundations of the Edge-Function Method <i>J. J. Grannell, University College, Cork, Ireland</i>	12 - 15
Taylor Expansions in the Boundary Element Method for Neumann Problems <i>M. H. Aliabadi, Southampton University, W. S. Hall, Teesside Polytechnic and T. G. Phemister, NEI Parsons Ltd., Newcastle-upon-Tyne, England</i>	12 - 31
Indicators and Estimators in P-Adaptive Boundary Elements <i>A. Reverter, A. Gonzalez and E. Alarcon, E.T.S. Ingenieros Industriales, Universidad Politecnica, J. Gutierrez Abascal, Madrid, Spain</i>	12 - 41
Generalized Boundary Methods <i>I. Herrera, Institute of Geophysics, National University of Mexico, Mexico</i>	12 - 55
Boundary Integral "Equation" Methods for the Signorini-Fichera Problem <i>P. D. Panagiotopoulos, Aristotle University, Greece and Institute of Technical Mechanics, Aachen, Federal Republic of Germany</i>	12 - 73
On the Spectrum of Certain Integral Operators and its Utilization for BEM in Elasticity <i>G. Rieder, Institut fur Technische Mechanik, Aachen, Germany</i>	12 - 85
The Boundary Element Method for Shape Design Synthesis of Elastic Structures <i>T. Burczynski, Institute of Mechanics and Fundamentals of Machine Design, Silesian Technical University, Gliwice, Poland and T. Adamczyk, Institute of Transport, Silesian Technical University, Katowice, Poland</i>	12 - 93
13. NUMERICAL TECHNIQUES	
The Application of Double Exponential Formulas in the Boundary Element Method <i>L. Jun, Visiting Scholar from Institute of Geology, Academia Sinica, Beijing, China; G. Beer and J. L. Meek, University of Queensland, Australia</i>	13 - 3
Effective Use of Monte Carlo Quadrature for Body Force Integrals Occurring in the Integral Form of Elastostatics <i>G. S. Gipson and C. V. Camp, Louisiana State University, U. S. A.</i>	13 - 17
On the Use of Discontinuous Elements in Two Dimensional Contact Problems <i>F. Paris, University of Seville and J. A. Garrido, Polytechnical University of Las Palmas, Spain</i>	13 - 27

The Solution of Axisymmetric Boundary Element Problems Using Curvilinear Coordinate Systems <i>Baocheng Li and C. A. Brebbia Southampton University and Wessex Institute of Technology, England</i>	13 - 31
Augmented Function and Boundary Element Methods for Sensitivity Analysis in Optimal Loading of Solids <i>R. A. Meric, Reasearch Institute for Basic Sciences, Tubitak, Kocaeli, Turkey</i>	13 - 41
An Iterative Boundary Integral Equation Method for Midly Nonlinear Elliptic Partial Differential Equation <i>M. Sakakihara, Okayama University of Science, Okayama, Japan</i>	13 - 49
An Efficient BEM for some Inhomogeneous and Nonlinear Problems <i>N. Kamiya and Y. Sawaki, Mie University, Tsu, Japan</i>	13 - 59
Boundary Element Analysis in the Presence of Dihedral Symmetry Under General Boundary Conditions <i>G. Fossa, G. Maier, P. Masarati and G. Novati, Technical University (Politecnico), Milan, Italy</i>	13 - 69
3-D BEM and Numerical Integration <i>Ch. Schwab and W. I. Wendland, Fachbereich Mathematik, Technische Hochschule Darmstadt, Germany</i>	13 - 85
A BEM Approach to the Bounding Techniques <i>C. Polizzotto, University of Palermo, Palermo, Italy</i>	13 - 103
Analytic Integration of Isoparametric 2D-Bounadry Elements <i>C. Katz, Ingenieurberatung, D-8138 Andechs, Romerweg, West Germany</i>	13 - 115

14. APPLICATIONS

Industrial Application of the Three Dimensional Boundary-Element- Method (BEM) Exemplified Through the BE-Programsystem DBETSY-3D <i>W. Bauer and M. Svoboda, Da imler-Benz AG, Stuttgart, West Germany</i>	14 - 3
Computer Aided Design of Cathodic Protection Systems <i>R. A. Adey, S. M. Niku, C. A. Brebbia and J. Finnegan, Computational Mechanics Consultants, Ashurst, Southampton, England and Conoco Norway Inc.</i>	14 - 21
Some Elastic and Inelastic Stress Analysis Problems by Boundary Element Method <i>Q. H. Du and Z. Z. Cen, Tsing Hua University, China and X. Ji and Z. W. Lou, Jiao Tung University, China</i>	14 - 45
The Application of the Finite Element Method in the Prediction of Cutting Tool Performance <i>M. M. Ahmad, N. I. H. E. Limerick, Ireland; W. A. Draper and R. T. Derricott, The Polytechnic, Wolverhampton, England</i>	14 - 61
3D and Axisymmetric Thermo-Elastic Stress Analysis by BEASY <i>M. Hongoh, Pratt & Whitney of Canada, Canada</i>	14 - 73

Determining of Secondary Current Distribution in an Electrochemical Cell Using BEM <i>A. J. Nowak, Institute of Thermal Technology, Technical University of Gliwice, Poland</i>	14 - 83
Investigation of the Boundary Element Method for Engineering Application <i>C. S. Lee and Y. M. Yoo, The Korea Advanced Institute of Science and Technology, Korea</i>	14 - 93
Response of Inclusions with Interface Separation, Friction and Slip <i>A.P.S. Selvadurai and M.C. Au Carleton University, Ontario, Canada</i>	14 - 109