

INTERNATIONAL JOURNAL OF
SOLIDS and
STRUCTURES

Volume Contents and Author Index
Volume 28, 1991



PERGAMON PRESS

OXFORD · NEW YORK · SEOUL · TOKYO

INTERNATIONAL JOURNAL OF SOLIDS AND STRUCTURES

Editor-in-Chief: CHARLES STEELE

Associate Editor: MARIE-LOUISE STEELE
Division of Applied Mechanics
Stanford University, Stanford,
CA 94305, U.S.A.

Consulting Editor and Editor-in-Chief, 1965–1985: GEORGE HERRMANN

Board of Editors

J. D. ACHENBACH	<i>Northwestern University</i>
L. BEVILACQUA	<i>Cidade Universitaria, Rio de Janeiro</i>
V. V. BOLOTIN	<i>USSR Academy of Sciences</i>
H. D. BUI	<i>Ecole Polytechnique</i>
D. HILLS	<i>Oxford University</i>
J. HUTCHINSON	<i>Harvard University</i>
B. L. KARIHALOO	<i>University of Sydney</i>
G. MAIER	<i>Politecnico di Milano</i>
M. MIKKOLA	<i>Helsinki University</i>
F. P. J. RIMROTT	<i>University of Toronto</i>
R. RIVLIN	<i>Lehigh University</i>
Y. SHINDO	<i>Tohoku University</i>
H. ZORSKI	<i>Polish Academy of Sciences</i>

Editorial Advisory Board

J. H. ARGYRIS	<i>Stuttgart</i>	E. REISSNER	<i>San Diego</i>
B. A. BOLEY	<i>New York</i>	J. SINGER	<i>Haifa</i>
H. LIEBOWITZ	<i>Washington</i>	I. N. SNEDDON	<i>Glasgow</i>
H. LIPPMANN	<i>Munich</i>	F. ZIEGLER	<i>Vienna</i>
F. NIORDSON	<i>Lyngby</i>	O. C. ZIENKIEWICZ	<i>Swansea</i>

Publishing, Subscription and Advertising Offices: Pergamon Press plc, Headington Hill Hall, Oxford OX3 0BW, U.K., Pergamon Press, Inc., 395 Saw Mill River Road, Elmsford, NY 10523, U.S.A.

Published 15 times a year. Annual institutional subscription rate (1991) DM 1690.00. Two-year institutional rate (1991/92) DM 3211.00. Personal subscription rate for those whose library subscribes at the regular rate (1991) available on request. Prices are subject to change without notice. Subscription rates for Japan include despatch by air and prices are available on application. Subscription enquiries from customers in North America should be sent to: Pergamon Press, Inc., 395 Saw Mill River Road, Elmsford, NY 10523, U.S.A., and for the remainder of the world to: Pergamon Press plc, Headington Hill Hall, Oxford OX3 0BW, U.K.

Back Issues

Back issues of all previously published volumes, in both hard copy and on microform, are available direct from Pergamon Press offices.

Copyright © 1991 Pergamon Press plc

It is a condition of publication that manuscripts submitted to the journal have not been published and will not be simultaneously submitted or published elsewhere. By submitting a manuscript, the authors agree that the copyright for their article is transferred to the publisher if and when the article is accepted for publication. However, assignment of copyright is not required from authors who work for organizations which do not permit such assignment. The copyright covers the exclusive rights to reproduce and distribute the article, including reprints, photographic reproductions, microform or any other reproductions of similar nature, and translations. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, electrostatic, magnetic tape, mechanical, photocopying, recording or otherwise, without permission in writing from the copyright holder.

Whilst every effort is made by the publishers and editorial board to see that no inaccurate or misleading data, opinion or statement appears in this journal, they wish to make it clear that the data and opinions appearing in the articles and advertisements herein are the sole responsibility of the contributor or advertiser concerned. Accordingly, the publishers, the editorial board and editors and their respective employees, officers and agents accept no responsibility or liability whatsoever for the consequences of any such inaccurate or misleading data, opinion or statement.

PHOTOCOPYING INFORMATION FOR USERS IN THE U.S.A.

The Item-fee Code for this publication indicates that authorization to photocopy items for internal or personal use is granted by the copyright holder for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service provided the stated fee for copying, beyond that permitted by Section 107 or 108 of the United States Copyright Law, is paid. The appropriate remittance of \$3.00 per copy per article is paid directly to the Copyright Clearance Center Inc., 27 Congress Street, Salem, MA 01970.

PERMISSION FOR OTHER USE

The copyright owner's consent does not extend to copying for general distribution, for promotion, for creating new works, or for resale. Specific written permission must be obtained from the publisher for such copying.

©™ The text paper used in this publication meets the minimum requirements of American National Standard for Information Sciences—Permanence of Paper for Printed Library Materials, ANSI Z39.48-1984.

The Item-fee Code for this publication is: 0020-7683/91 \$3.00 + .00

Volume Contents

NUMBER 1

- R. A. Chaudhuri and K. R. Abu-Arja** 1 Static analysis of moderately-thick finite antisymmetric angle-ply cylindrical panels and shells
- H. R. H. Kabir and R. A. Chaudhuri** 17 Free vibration of shear-flexible anti-symmetric angle-ply doubly curved panels
- T. A. Conway and G. A. Costello** 33 Response of a strand with elliptical outer wires
- A. C. Wijeyewickrema and L. M. Keer** 43 Matrix fracture in brittle matrix fiber-reinforced composites
- C. S. Chang and L. Ma** 67 A micromechanical-based micropolar theory for deformation of granular solids
- G. Baker** 87 Optimum pointwise reinforcement requirements in plastic fracturing continua
- C. Chung and J. W. Eischen** 105 The free-edge stress singularity at an interface between bilinear materials
- D. D. Ang, T. Folias and F. Keinert** 115 Penetration mechanics: predicting the location of a viscoplastic boundary and its effect on the stresses

Announcements

- 131 Conference on Fracture Processes in Brittle Disordered Materials, Oranje Hotel, Noordwijk, The Netherlands, 19–21 June 1991
- 132 Optimization of Large Structural Systems, NATO/DFG Advanced Study Institute, Berchtesgaden, Germany, 23 September–4 October 1991

Call for Papers

- 133 Pan American Congress of Applied Mechanics, São Paulo, Brazil, 4–8 January 1993

NUMBER 2

- Niels Saabye Ottosen and Kenneth Runesson** 135 Acceleration waves in elasto-plasticity
- Fei-Yue Wang** 161 Two-dimensional theories deduced from three-dimensional theory for a transversely isotropic body—II. Plane problems
- Hideo Takabatake** 179 Static analyses of elastic plates with voids
- Davide Bigoni and Tomasz Hueckel** 197 Uniqueness and localization—I. Associative and non-associative elastoplasticity

- Davide Bigoni and Tomasz Hueckel** 215 Uniqueness and localization—II. Coupled elastoplasticity
- A. Y. Aköz, M. H. Omurtag and A. N. Doğruoğlu** 225 The mixed finite element formulation for three-dimensional bars
- Z. Suo, G. Bao, B. Fan and T. C. Wang** 235 Orthotropy rescaling and implications for fracture in composites
- S. X. Gong and S. A. Meguid** 249 A general solution to the antiplane problem of an arbitrarily located elliptical hole near the tip of a main crack

Announcement

- 265 Maxwell Post-Doctoral Fellowship of the French Academie des Sciences, Grenoble, France

NUMBER 3

- Ch. Zhang** 267 A novel derivation of non-hypersingular time-domain BIEs for transient elastodynamic crack analysis
- H. R. Schwieter and P. S. Steif** 283 Analysis of a broken fiber in a weakly bonded composite
- H. R. Schwieter and P. S. Steif** 299 The tensile strength of a fiber-reinforced ceramic
- Gabriel Cederbaum, Jacob Aboudi and Isaac Elishakoff** 317 Dynamic instability of shear-deformable viscoelastic laminated plates by Lyapunov exponents
- A. E. Giannakopoulos and P. Gudmundson** 329 The stresses around a partly microcracked hole in certain ceramic materials under internal pressure
- A. N. Palazotto and Peter E. Linnemann** 341 Vibration and buckling characteristics of composite cylindrical panels incorporating the effects of a higher order shear theory
- Shaowen Qin, Hui Fan and Toshio Mura** 363 The eigenstrain formulation for classical plates
- E. J. Barbero and J. N. Reddy** 373 Modeling of delamination in composite laminates using a layer-wise plate theory
- R. Y. S. Pak and J.-D. M. Saphores** 389 Rocking rotation of a rigid disc in a half-space

NUMBER 4

- Ning Jie and Chen Xu** 403 On the properties of plastic flow of material under nonproportional cyclic loading
- Arnold D. Kerr and Douglas W. Coffin** 413 Beams on a two-dimensional Pasternak base subjected to loads that cause lift-off

Shu-Ang Zhou	423	A material multipole theory of elastic dielectric composites
Ming-Hwa R. Jen, Wen-Sen Lin and Jer-Ming Hsu	449	Residual stresses in symmetric, double lap and double strap joints
W. K. Lee	471	An insight into wire rope geometry
Horacio Sosa	491	Plane problems in piezoelectric media with defects
R. England and J. G. Simmonds	507	Simplifications under the Kirchhoff hypothesis of Taber's nonlinear theory for the axisymmetric bending and torsion of elastic shells of revolution
L. M. Brock	517	Exact transient results for penny-shaped crack growth under combined loading

NUMBER 5

M. Bouden, S. K. Datta and A. H. Shah	533	Dynamic response of a layered half-space with interfacial cracks
G. F. Dargush and P. K. Banerjee	549	Boundary element methods for three-dimensional thermoplasticity
W. A. Green and E. Rhian Green	567	Stress variation due to an impact line load on a four-ply fibre composite plate
Kuang-Chong Wu	595	Application of the M -integral to cracked anisotropic composite wedges
L. K. Dong, H. Y. Zhang and C. W. Lung	607	Geometric gauge theory of metric defects
Ziliang Zhou	617	Creep and stress relaxation of an incompressible viscoelastic material of the rate type
Pin Lu and Maoguang Huang	631	Computation of the fundamental solution for shallow shells involving shear deformation
G. A. Rogerson	647	Wave propagation in elastic bodies with restricted shear
K. C. Valanis	657	Letter to the Editor
C. J. Fazio	663	Author's Closure
K. T. Sundara Raja Iyengar	665	Letter to the Editor
E. S. Folias	667	Author's Closure

NUMBER 6

David M. Stump	669	Toughening and strengthening of ceramics reinforced by dilatant transformations and ductile particles
-----------------------	-----	---

J. Besson and M. Abouaf	691	Behaviour of cylindrical HIP containers
Huajian Gao	703	A boundary perturbation analysis for elastic inclusions and interfaces
Hoon Huh and Wei H. Yang	727	A general algorithm for limit solutions of plane stress problems
A. K. Naghdi	739	Bending of a perforated circular cylindrical cantilever
M. K. Kuo and S. H. Cheng	751	Elastodynamic responses due to anti-plane point impact loadings on the faces of an interface crack along dissimilar anisotropic materials
J. Lubliner	769	A simple model of generalized plasticity
H. Ramsey	779	Localized effect of clamp or socket end connections on helical wires in multilayered cables
J. Toribio and M. Elices	791	Influence of residual stresses on hydrogen embrittlement susceptibility of prestressing steels
		<i>Announcements</i>
	805	Symposium on High-Performance Computing for Flight Vehicles, Sheraton National Hotel, Washington, DC, 7-9 December 1992
	806	Information Retrieval Service on FE and BE Literature and Software

NUMBER 7

H. Cohen and Q.-X. Sun	807	Snapping of an elastic pseudo-rigid body
Victor Birman	819	Thermal bending of shear-deformable orthotropic cylindrical shells reinforced by cylindrically-orthotropic rings
Omri Rand and Yehuda Stavsky	831	Free vibrations of spinning composite cylindrical shells
H.-B. Mühlhaus and E. C. Aifantis	845	A variational principle for gradient plasticity
A. Needleman and M. Ortiz	859	Effect of boundaries and interfaces on shear-band localization
Hideo Takabatake	879	Dynamic analyses of elastic plates with voids
G. F. Dargush and P. K. Banerjee	897	A boundary element method for axisymmetric soil consolidation

- J. B. Kosmatka and S. B. Dong** 917 Saint-Venant solutions for prismatic anisotropic beams
- Announcement*
- 939 First International Conference on Fracture Mechanics of Concrete Structures

NUMBER 8

- Mohamad S. Qatu** 941 Free vibration of laminated composite rectangular plates
- Chwan-Huei Tsai and Chien-Ching Ma** 955 Exact transient solutions of buried dynamic point forces and displacement jumps for an elastic half space
- B. J. Lee and M. E. Mear** 975 Effect of inclusion shape on stiffness of isotropic and transversely isotropic two-phase composites
- Kiyohiro Ikeda and Kazuo Murota** 1003 Random initial imperfections of structures
- J. M. Herrmann** 1023 The limitations of the model of a crack along the interface of an inclusion in an elastic matrix
- William S. Slaughter and J. Lyell Sanders, Jr** 1041 A model for load-transfer from an embedded fiber to an elastic matrix
- M. Y. Tsai and J. Morton** 1053 The stresses in a thermally loaded bimaterial interface
- Announcements*
- 1077 IUTAM Symposium on Inverse Problems in Engineering Mechanics
- 1078 5th International Conference on Underground Space and Earth Sheltered Structures (ICUSESS '92)

NUMBER 9

- Aouni A. Lakis and André Laveau** 1079 Non-linear dynamic analysis of anisotropic cylindrical shells containing a flowing fluid
- H. Fan, L. M. Keer and T. Mura** 1095 The effect of plastic deformation on crack initiation in fatigue
- H. Irschik** 1105 Analogy between refined beam theories and the Bernoulli–Euler theory
- P. Dong and J. Pan** 1113 Elastic–plastic analysis of cracks in pressure-sensitive materials
- Sen Yung Lee and Yee Hsiung Kuo** 1129 Non-conservative stability of intermediate spring supported columns with an elastically restrained end support
- M. Paley and J. Aboudi** 1139 Plastic buckling of metal matrix laminated plates

S. T. Raveendra and P. K. Banerjee	1155	Analysis of rotating solids with cracks by the bou element method
Chang-Shi Xu	1171	Buckling and post-buckling of symmetrically lami moderately-thick spherical caps
M. Inoue, Y. Takizawa and A. Okada	1185	Non-linear flexure testing of a high-strength glass c

INTERNATIONAL JOURNAL OF SOLIDS AND STRUCTURES
VOLUME 28
AUTHOR INDEX

- Abouaf, M. 691
Aboudi, J. 317, 1139
Abu-Arja, K. R. 1
Aifantis, E. C. 845
Aköz, A. Y. 225
Ang, D. D. 115
- Baker, G. 87
Banerjee, P. K. 549, 897, 1155
Bao, G. 235
Barbero, E. J. 373
Besson, J. 691
Bigoni, D. 197, 215
Birman, V. 819
Bouden, M. 533
Brock, L. M. 517
- Cederbaum, G. 317
Chang, C. S. 67
Chaudhuri, R. A. 1, 17
Cheng, S. H. 751
Chung, C. 105
Coffin, D. W. 413
Cohen, H. 807
Conway, T. A. 33
Costello, G. A. 33
- Dargush, G. F. 549, 897
Datta, S. K. 533
Dogruoglu, A. N. 225
Dong, L. K. 607
Dong, P. 1113
Dong, S. B. 917
- Eischen, J. W. 105
Elices, M. 791
Elishakoff, I. 317
England, R. 507
- Fan, B. 235
Fan, H. 363, 1095
Fazio, C. J. 663
Folias, E. S. 667
Folias, T. 115
- Gao, H. 703
Giannakopoulos, A. E. 329
Gong, S. X. 249
Green, E. R. 567
Green, W. A. 567
- Gudmundson, P. 329
- Herrmann, J. M. 1023
Hsu, J.-M. 449
Huang, M. 631
Hueckel, T. 197, 215
Huh, H. 727
- Ikeda, K. 1003
Inoue, M. 1185
Irschik, H. 1105
Iyengar, K. T. S. R. 665
- Jen, M.-H. R. 449
Jie, N. 403
- Kabir, H. R. H. 17
Keer, L. M. 43, 1095
Keinert, F. 115
Kerr, A. D. 413
Kosmatka, J. B. 917
Kuo, M. K. 751
Kuo, Y. H. 1129
- Lakis, A. A. 1079
Laveau, A. 1079
Lee, B. J. 975
Lee, S. Y. 1129
Lee, W. K. 471
Lin, W.-S. 449
Linnemann, P. E. 341
Lu, P. 631
Lublimer, J. 769
Lung, C. W. 607
- Ma, C.-C. 955
Ma, L. 67
Mear, M. E. 975
Meguid, S. A. 249
Morton, J. 1053
Mühlhaus, H.-B. 845
Mura, T. 363, 1095
Murota, K. 1003
- Naghdi, A. K. 739
Needleman, A. 859
- Okada, A. 1185
Omurtag, M. H. 225
Ortiz, M. 859
Ottoosen, N. S. 135
- Pak, R. Y. S. 389
Palazotto, A. N. 341
Paley, M. 1139
Pan, J. 1113
- Qatu, M. S. 941
Qin, S. 363
- Ramsey, H. 779
Rand, O. 831
Raveendra, S. T. 1155
Reddy, J. N. 373
Rogerson, G. A. 647
Runesson, K. 135
- Sanders, J. L., Jr 1041
Saphores, J.-D. M. 389
Schwietert, H. R. 283, 299
Shah, A. H. 533
Simmonds, J. G. 507
Slaughter, W. S. 1041
Sosa, H. 491
Stavsky, Y. 831
Steif, P. S. 283, 299
Stump, D. M. 669
Sun, Q.-X. 807
Suo, Z. 235
- Takabatake, H. 179, 879
Takizawa, Y. 1185
Toribio, J. 791
Tsai, C.-H. 955
Tsai, M. Y. 1053
- Valanis, K. C. 657
- Wang, F.-Y. 161
Wang, T. C. 235
Wijeyewickrema, A. C. 43
Wu, K.-C. 595
- Xu, C. 403
Xu, C.-S. 1171
- Yang, W. H. 727
- Zhang, Ch. 267
Zhang, H. Y. 607
Zhou, S.-A. 423
Zhou, Z. 617