

EXCLU DU PRÊT

Reçu le 06 FEV. 1990

# Transactions OF THE ASME

Published Quarterly by The American Society of Mechanical Engineers

September 1989



## Journal of Applied Mechanics

# Transactions of the ASME®

Technical Editor, LEON M. KEER (1993)

The Technological Institute  
Northwestern University  
Evanston, IL 60201

## APPLIED MECHANICS DIVISION

Chairman, THOMAS L. GEERS  
Secretary, S. LEIBOVICH  
Associate Editors,  
R. M. CHRISTENSEN (1990)  
S. K. DATTA (1993)  
G. J. DVORAK (1993)  
C. O. HORGAN (1992)  
R. L. HUSTON (1991)  
D. J. INMAN (1992)  
W. G. KNAUSS (1991)  
F. A. LECKIE (1991)  
J. T. C. LIU (1993)  
R. M. McMEEKING (1991)  
A. K. NOOR (1991)  
J. W. NUNZIATO (1992)  
J. W. RUDNICKI (1992)  
C. F. SHIH (1993)  
J. G. SIMMONDS (1992)  
P. D. SPANOS (1992)  
K. R. SREENIVASAN (1992)  
Z. WARHAFT (1992)  
L. T. WHEELER (1991)

## BOARD ON COMMUNICATIONS

Chairman and Vice-President  
R. E. NICKELL

Members-at-Large  
W. BEGELL, T. F. CONRY, M. FRANKE,  
R. L. KASTOR, M. KUTZ, R. MATES,  
T. C. MIN, E. M. PATTON, R. E. REDER,  
R. D. ROCKE, F. W. SCHMIDT,  
W. O. WINER, A. J. WENNERSTROM,  
B. ZEILS

President, C. O. VELZY  
Exec. Dir.  
D. L. BELDEN  
Treasurer, ROBERT A. BENNETT

PUBLISHING STAFF  
Mng. Dir., Publ.,  
CHARLES W. BEARDSLEY  
Managing Editor,  
CORNELIA MONAHAN  
Production Editor, JUDY SIERANT  
Prod. Asst., MARISOL ANDINO

Transactions of the ASME, Journal of Applied Mechanics (ISSN 0021-8936) is published quarterly (Mar., June, Sept., Dec.) for \$120 per year by The American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017. Second class postage paid at New York, NY and additional mailing offices. POSTMASTER: Send address changes to Transactions of the ASME, Journal of Applied Mechanics, c/o THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS, 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300.

CHANGES OF ADDRESS must be received at Society headquarters seven weeks before they are to be effective. Please send old label and new address.

PRICES: To members, \$28.00, annually; to nonmembers, \$120.00. Add \$15.00 for postage to countries outside the United States and Canada.

STATEMENT from By-Laws. The Society shall not be responsible for statements or opinions advanced in papers or . . . printed in its publications (B7.1, Par. 3).

COPYRIGHT © 1989 by The American Society of Mechanical Engineers. Reprints from this publication may be made on condition that full credit be given to the TRANSACTIONS OF THE ASME, JOURNAL OF APPLIED MECHANICS, and the author, and date of publication be stated.

INDEXED by Applied Mechanics Reviews and Engineering Information, Inc.

# Journal of Applied Mechanics

Published Quarterly by The American Society of Mechanical Engineers

VOLUME 56 • NUMBER 3 • SEPTEMBER 1989

## 491 Reviewers

## TECHNICAL PAPERS

- 493 The Elastic Response of Creep Damaged Materials  
M. Rides, A. C. F. Cocks, and D. R. Hayhurst
- 499 An Anisotropic Hardening Rule for Elastoplastic Solids Based on Experimental Observations (89-WA/APM-4)  
F. Ellyin
- 508 On the Inversion of Residual Stresses From Surface Displacements  
Z. Gao and T. Mura
- 514 Application of an Internal Variable Constitutive Model to Predict Creep Response of an Aluminum Alloy Under Multiaxial Loading  
I. U. Mahmood, M. O. Faruque, and M. M. Zaman
- 519 An Asymptotic Analysis of Three-Dimensional Extrusion (89-WA/APM-19)  
N. Aravas and R. M. McMeeking
- 527 Adiabatic Shear Banding in Plain Strain Problems (89-WA/APM-16)  
R. C. Batra and D.-S. Liu
- 535 Dynamic Modulus of Poroelastic Materials  
A. Okuno and H. B. Kingsbury
- 541 Squeeze Film Behavior for Anisotropic Porous Rectangular Plates  
A. B. Wheeler and R. Balasubramanyam
- 546 Environmentally-Induced Expansion of Heterogeneous Media (89-WA/APM-9)  
K. Schugasser
- 550 A Green's Function of Anticracks and Their Interaction With Load-Induced Singularities (89-WA/APM-15)  
J. Dundur and X. Markenscoff
- 556 Line Inclusions in Anisotropic Elastic Solids (89-WA/APM-17)  
Q. Li and T. C. T. Ting
- 564 Surface Displacements and Stress Field Generated by a Semi-Ellipsoidal Surface Inclusion  
B. N. Cox
- 571 An Exact Transient Study of Dislocation Emission and its Effects on Dynamic Fracture Initiation (89-WA/APM-5)  
L. M. Brock and J.-S. Wu
- 577 Elastic Yield Zone Around an Interfacial Crack Tip (89-WA/APM-6)  
E. Zywicz and D. M. Parks
- 585 Thermal Stresses at the Edge of a Bimetallic Thermostat (89-WA/APM-7)  
A.-Y. Kuo
- 590 How to Model a Bonded Joint  
P. Villaggio
- 595 Interfacial Stresses in Bimetal Thermometers (90-WA/APM-1)  
E. Suhir
- 601 Three-Dimensional Transient Interlaminar Thermal Stresses in Angle-Ply Composites (89-WA/APM-14)  
Y. R. Wang and T.-W. Chou
- 609 The Extended Free Formulation of Finite Elements in Linear Elasticity (89-WA/APM-12)  
C. A. Felippa
- 617 A Boundary Integral Equation Formulation in Derivative Unknowns for Two-Dimensional Potential Problems (89-WA/APM-13)  
J. H. Choi and B. M. Kwak
- 624 Wrinkling of Pressurized Membranes (89-WA/APM-10)  
D. J. Steigmann and A. C. Pipkin
- 629 Simultaneous Optimization of Beams and Their Elastic Foundations for Minimum Compliance  
R. H. Plaut
- 633 The Buckling of Thin-Walled Open-Profile Bars  
M. Ojalvo
- 639 Cantilever Rod in Cross Wind (89-WA/APM-8)  
C. Y. Wang
- 644 Elastoplastic Buckling of Annular Plates in Pure Shear  
E. Ore and D. Durban
- 652 Moderately Thick Angle-Ply Cylindrical Shells Under Internal Pressure  
K. R. Abu-Araja and R. A. Chaudhuri
- 658 Active Parameter Control of Nonlinear Vibrating Structures  
S. F. Masri, R. K. Miller, T. J. Dehghanyar, and T. K. Caughey
- 667 An Alternative Perturbation Procedure of Multiple Scales for Nonlinear Dynamics Systems  
S.-L. Lau, Y. K. Cheung, and S. Chen

(Contents continued on Inside Back Cover)