

**ANISOTROPY AND LOCALIZATION
OF PLASTIC DEFORMATION**

**Proceedings of PLASTICITY '91:
The Third International Symposium on
Plasticity and Its Current Applications**

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Plasticity and Its Current Applications**

Edited by

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and

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PREFACE

Present developments in materials science, mechanics and engineering, as well as the demands of modern technology, result in a new and growing interest in plasticity and in bordering domains of the mechanical behavior of materials. This growing interest is attested to by the success of both *The International Journal of Plasticity*, which after its inception rapidly became the leading journal for plasticity research, and the series of International Symposia on Plasticity and Its Current Applications, which is now the premier international forum for plasticity research dissemination.

The First International Symposium on Plasticity and Its Current Applications was conceived and organized by Professor Akhtar S. Khan, and was held at the University of Oklahoma (Norman, Oklahoma, USA) from July 30 to August 3, 1984. It was attended by over one hundred scientists from fifteen countries. "Plasticity '89: the Second International Symposium on Plasticity and Its Current Applications" was held at Mie University (Tsu, Japan) from July 31 to August 4, 1989; this symposium was co-chaired by Professors Khan and Tokuda. The main emphasis of this meeting was on dynamic plasticity and micromechanics, although it included other aspects of plasticity as well. It was attended by over two hundred researchers from twenty-three nations.

"Plasticity '91: the Third International Symposium on Plasticity and Its Current Applications" will be held in Grenoble (France) from August 12 to 16, 1991. The choice of France as the site for this symposium is to recognize the contribution of the "French School" in plasticity research and to facilitate the participation of the French scientific community in particular and the European community in general in this prominent international meeting. Also, this will provide an opportunity to the international plasticity community to visit beautiful France, taste her cuisine and experience her culture. It is expected to be attended by over two hundred scientists from twenty-six countries around the world. The main emphasis of the symposium will be on Anisotropic Plasticity and Deformation Localization; however, it will also include many other multi-faceted aspects of the Plastic and Viscoplastic Behavior of materials, such as single-crystalline and polycrystalline metals and superalloys, shape memory alloys, ceramics, polymers, composite materials, ice, clays and reinforced soils, sand and granular materials, porous materials, rocks, and jointed rocks.

The symposium will treat different plastic aspects of anisotropy, hardening, localization, damage, failure, fracture, microscopic and macroscopic behavior, relations between microstructure and overall properties in materials science and

engineering, as well as applications in mechanical and civil engineering. Besides general sessions, the Symposium will include topical sessions dealing with the following specific topics:

- Thermodynamical Aspects of Constitutive Laws
- Mechanics of Plastic Deformation and Overall Behavior
- Self-organization of Microstructure and Strain Localization
- Simplified Analysis in Elastoplasticity
- Instability Phenomena in Finite Plastic Deformation Processes
- Constitutive Modeling in Dynamic Plasticity
- The Response of Bars and Plates to Impact Loadings
- Elastic-Plastic Materials as Simple Materials
- Kinematical and Constitutive States of Elastic-Plastic Material
- Anisotropic Inelasticity of Polymers and Polymer Composites
- Finite Plasticity

This proceedings volume contains 161 compact versions of papers to be presented at the "Plasticity '91" symposium. Other papers were received too late to be included in this volume. Due to the time limitation and desirability to have this proceedings ready at the symposium, it was not possible to correct minor English mistakes in the paper. Also, the variation of the English language from one country to another may interest the readers.

Such an international symposium cannot be organized without financial support. The chairmen are therefore indebted to the French Centre National de la Recherche Scientifique and the French Ministry of Defence (DRET) for the funds they contributed to the symposium. Other organizations which will bring their financial support in the meantime will be acknowledged in the final program. Finally, we would like to gratefully acknowledge Ms Meena Khan, and Ms Wei-Wei He, as well as Elsevier Science Publishers for their excellent job in publishing this volume. We would like to express our thanks to all of the French colleagues who gave their help and support during the preparatory phase of this meeting. A word of appreciation is owed to Dr Monique Piau, Director of the Institut de Mécanique de Grenoble, and to Dr Gérard Biguenet for their valuable assistance in the local organization.

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CONTENTS

<i>Preface</i>	v
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METAL MATRIX COMPOSITES AND LAMINATED MATERIALS

Recent Developments in the Analysis of Metal Matrix Composites by the Method of Cells <i>J. Aboudi</i>	3
A Finite Strain Plasticity Theory for Transversely Isotropic Materials <i>N. Aravas</i>	7
The Effect of Laminate Thickness on Fiber/Matrix Debonding in Metal Matrix Composites <i>J.G. Boyd, R.H. Jones, and D.H. Allen</i>	11
Effective Anisotropic Properties of Creeping Composites <i>P. Ponte-Castañeda</i>	15
On Thermal Hardening and Uniform Fields in Two-Phase Composite Materials <i>G.J. Dvorak</i>	19
Fracture Analysis of Microlaminate Composites with Plastically Deforming Matrices <i>G.A. Kardomateas</i>	23
Thermoelastic-Plastic Deformations of Orthotropic Materials <i>A.J.M. Spencer</i>	28

ADIABATIC SHEAR BANDS AND OTHER LOCALIZED DEFORMATION

A Shear Band Analysis in Elastoplastic Granular Material <i>J.P. Bardet and J. Proubet</i>	35
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Hierarchy of Localization Phenomena Inside, At the Boundaries and Interfaces of Solids	39
<i>A. Benallal and R. Billardon</i>	
On Neck Formation in the Cold Drawing of Viscoelastic Fibers	43
<i>B.D. Coleman and D.C. Newman</i>	
Micropolar Elasto-Plasticity and Its Role in Localization Analysis	47
<i>A. Dietsche, P. Steinmann, and K. Willam</i>	
Adiabatic Shear Band Localization in Elastic-Plastic Single Crystals	51
<i>M.K. Duszek-Perzyna and P. Perzyna</i>	
The Genesis of S-Like Fracture Shapes During Transverse Shearing of Metals	56
<i>E.S. Dzidowski</i>	
A Note on Shear Banding and Material Instability in Finitely Deformed Compressible Materials: An Example in Thin Sheets	60
<i>Y.K. Lee</i>	
Shear Localization in Crystallographic Bands in Rolled Copper and Brass	65
<i>T. Leffers and N. Hansen</i>	
On the Stability of Steady Shear Flows of Thermo-Viscoplastic Materials	69
<i>A. Molinari and Y.M. Leroy</i>	
The Effect of Heat Release on the Character of Plastic Flow: Linear Stability Analysis	73
<i>A. Molinari, Y. Estrin, and D. Dudzinski</i>	
Collective Dislocation Behavior and Plastic Instabilities – Micro and Macro Aspects	77
<i>H. Neuhäuser</i>	
Influence of Thermodynamical Couplings on Adiabatic Shear Band Localization Failure	81
<i>P. Perzyna</i>	
Effect of Crystal Anisotropy on the Interaction between Two Holes	87
<i>A.M. Philip and J.-H. Schmitt</i>	
Effect of Triaxial Tension on Flow Localization for Different Plastic Spins	91
<i>V. Tvergaard and E. Van Der Giessen</i>	

Susceptibility to Shear Band Formation in Work Hardening Materials . . .	95
<i>T.W. Wright</i>	
On the Structure and Width of Shear Bands in Finite Elastoplastic Deformations	99
<i>H.M. Zbib and E.C. Aifantis</i>	
Shear Band Development in a Viscoplastic Cylinder	103
<i>X.-T. Zhang and R.C. Batra</i>	

TEXTURE, DISLOCATION AND MICRO-MECHANICAL ANALYSES

Representation of Microstructure and Mechanical Behavior of Polycrystals . . .	109
<i>B.L. Adams, J.P. Boehler, M. Guidi, and E.T. Onat</i>	
Mechanical Properties, Deformation Textures, Elastoplastic Behavior of BCC Polycrystalline Materials	114
<i>D. Ceccaldi, F. Yala, T. Baudin, R. Pennelle, and F. Royer</i>	
Variational Problems in Defective Crystals	118
<i>C. Davini, I. Fonseca, and G. Parry</i>	
Simulation of Deformation-Induced Anisotropy in Metal Forming Applications	122
<i>P.R. Dawson, Y.B. Chastel, and A.M. Maniatty</i>	
Elastic-Plastic Anisotropic Behavior Resulting from Microheterogeneity . .	126
<i>A. Elomri and F. Sidoroff</i>	
Microscopic and Crystallographic Aspects of Flow Stress Anisotropy . . .	131
<i>N. Hansen and D.J. Jensen</i>	
Computational Study of Polycrystalline Behavior Under Complex Loading Conditions	135
<i>F. Havlíček and M. Tokuda</i>	
On the Accuracy of the Taylor Assumption in Polycrystalline Plasticity . .	139
<i>S.R. Kalidindi, C.A. Bronkhorst, and L. Anand</i>	
Ultrasonic Nondestructive Evaluation of Micro Slip Band and Plastic Anisotropy Growth	143
<i>M. Kobayashi</i>	

Microaspects of Plastic Deformation and Global Mechanical Performance of Metals	148
<i>A. Korbøl and M. Berveiller</i>	
Transition of Viscoplasticity from the Single Crystal to the Polycrystal Level	152
<i>K.M. Murali and G.J. Weng</i>	
Elastoplastic Self-Consistent Modelling of BCC Polycrystals at Sequential Loadings	156
<i>A. Naddari, P. Lipinski, and M. Berveiller</i>	
Behavior of Textured FCC Sheet Metals	160
<i>K.W. Neale and Y. Zhou</i>	
A Micromechanical Model for Zirconium Stress-Strain Behavior	164
<i>P. Pilvin and G. Cailletaud</i>	
Finite Element Simulation of the Elastoplastic Deformation of Tricrystals: Comparisons with Experiments and Analytical Solutions	168
<i>J.L. Raphanel, C. Rey, and C. Teodosiu</i>	
Plastic Deformation of Ionic Crystals	171
<i>B. Schaeffer</i>	
Simulation of Dislocation Pattern Formation by Cellular Automata	175
<i>E. Steck and H.W. Hesselbarth</i>	
Texture vs. Microstructure in Anisotropic Plasticity	179
<i>C. Teodosiu</i>	
Analytical Representation of Polycrystal Yield Surfaces	183
<i>L.S. Tóth, P. Van Houtte, and A. Van Bael</i>	
Bounds for the Overall Creep Behavior of Textured Polycrystals	187
<i>J.R. Willis</i>	

BEHAVIOR OF GRANULAR POROUS MEDIA

Limit Loads of Reinforced Structures	193
<i>R. Abdi and J. Pastor</i>	
Elastoplastic Modeling for Soft Rocks and Ceramics in the Ductile Regime	197
<i>M. Aubertin, D.E. Gill, B. Ladanyi, and R. Chapuis</i>	

Constitutive Equations for Rock Salt	201
<i>N. Cristescu</i>	
On Finite Elastoplasticity Models In Porous Media Theories	205
<i>W. Ehlers</i>	
Description of the Behavior of Reinforced Soil Using the Homogenization Method	209
<i>E. Pruchnicki and I. Shahrou</i>	
Soft Clay Behavior Via Elasto-Viscoplasticity	213
<i>M. Emir</i>	
A New Concept on the Non-Associative Plastic Flow	217
<i>S. Jemioło and M. Kwieciński</i>	
A High Capacity Cubical Device and Multi-Axial Testing for Constitutive Modeling of Concrete	221
<i>A.R. Kukreti, M. Zaman, and D.K. Mishra</i>	
An Anisotropic Hardening Rule for Saturated Clays	225
<i>A.S. Kumbhojkar</i>	
A Double Hardening Constitutive Model for Bulk Solids	229
<i>L. Lancelot and I. Shahrou</i>	
Analytical Study of the Coalescence of Cavities in Ductile Fracture of Metals	233
<i>J.-B. Leblond and G. Perrin</i>	
Plastic Flow, Instability and Modes of Failure in the Uniaxial Compression of Porous Cylinders	237
<i>J.H. Lee and Y. Zhang</i>	
Creep Law of Rock Ice with Anisotropic Fabric Inferred from Homogenization	242
<i>L. Lliboutry</i>	
Dynamic Strain-Localization in Compressible Fluid-Saturated Porous Media	246
<i>B. Loret and O. Harireche</i>	
Constitutive Law of Porous Viscous Materials	250
<i>J.-C. Michel and P. Suquet</i>	
A Model to Describe the Yielding of an Elastic-Plastic Porous Solid	254
<i>S. Nagaki, M. Goya, and R. Sowerby</i>	

FEM Analysis of Water Saturated Soil by a Gradient Dependent Elasto-Viscoplastic Models	258
<i>F. Oka, A. Yashima, T. Adachi, and E.C. Aifantis</i>	
Anisotropic Plasticity of a Porous Material with Aligned Spheroidal Voids	262
<i>Y.P. Qiu and G.J. Weng</i>	
Elasto-Viscoplastic Modelling of Porous Rock Under High Confining Pressure	266
<i>J.F. Shao, M. Bederiat, and J.P. Henry</i>	
Elastic-Plastic Behavior of High Porosity Rock	270
<i>Y. Xiang, S. Huang, and A.S. Khan</i>	
A Simple Model for Sands and Application to Wave Induced Response of Sea Floor Deposits	274
<i>Q.S. Yang and H.B. Poorooshasb</i>	

FINITE PLASTICITY

Plastic Dual Potential for Metals and Application to Minimum Plastic Work Path Calculations	281
<i>F. Barlat, K. Chung, and O. Richmond</i>	
An Experimental Study of Internal Constraints Bounding Isotropic and Orthotropic Domains for Large Finite Deformation in Cubic Single Crystals	285
<i>J.F. Bell</i>	
Recent Developments in Finite Rigid Plasticity	291
<i>J. Casey</i>	
On the Application of the Integral Constitutive Equation for the Description of Anisotropic Hardening in Plasticity	297
<i>K. Chen and Z.-B. Kuang</i>	
A Kinematical Justification of Some Constitutive Assumptions in Plasticity	301
<i>G. Del Piero</i>	
On Kinematic Hardening Rules	305
<i>R.N. Dubey, R. Sauve, and S. Bedi</i>	
Equivalent Systems for Inelastic Analysis of Members Subjected to Large Deformations	309
<i>D.G. Fertis and C.T. Lee</i>	

G. I. Taylor Revisited: The Cone of Unextended Directions in Double Slip <i>K.S. Haver</i>	315
Large Strain Effects During Free-End Torsion of Copper Bars <i>J.J. Jonas and L.S. Tóth</i>	319
Finite Inelastic Deformation Analysis with Unified Constitutive Models <i>H.-P. Hackenberg and F.G. Kollmann</i>	323
The Endochronic Plastic Behavior of Brass Under Tension-Torsion Strain Path with Circular Corners <i>C.F. Lee</i>	327
On the Characterization of Plastic Loading in the Theory of Materials with Elastic Range <i>M. Lucchesi and P. Podio-Guidugli</i>	331
Rotation Problems in Simple Shear Deformation <i>K. Miyauchi</i>	335
Microscopic Aspects of Finitely Deforming Inelastic Materials <i>P.M. Naghdi</i>	339
A Survey of Some Mathematical Descriptions of Deformations and States for Elastic-Plastic Materials <i>D.R. Owen</i>	345
Tensile Deformation of TI-6AL-4V Alloy Sheet Under Transformational Superplasticity Condition <i>K. Sato, T. Kajikawa, and K. Ugajin</i>	349
On the Loading Conditions and the Decomposition of Deformation <i>C. Tsakmakis</i>	353
Analysis of Damage and Plasticity for Large Deformation with Application in Simple Shear <i>G.Z. Voyiadjis and P.I. Kattan</i>	357
On Subsequent Yield Surfaces After Finite Shear Pre-Straining <i>X. Wang, A.S. Khan, and H. Yan</i>	361
On Oscillatory Shear Stress in Simple Shear <i>W. Wu and D. Kolymbas</i>	365
Dual Non-Euclidean Norms and Normality Theorem in Plasticity <i>W.H. Yang</i>	369

DYNAMIC PLASTICITY AND VISCO-PLASTICITY

Evaluation of Correct Flow Equations for Internal Variable Constitutive Models	377
<i>S. Brown, V. Dave, and P. Kumar</i>	
Some Remarks on the Concept of Viscoplastic Models of the Overstress-Type	381
<i>O.T. Bruhns</i>	
A Unified Constitutive Model with Dislocation Densities as Internal Variables	385
<i>Y. Estrin and H. Mecking</i>	
Prediction and Verification of Material Behavior Using the Chaboche Viscoplastic Constitutive Theory	389
<i>D.L. Jones and A.M. El-Assal</i>	
Modeling of the Dynamic Deformation and Fracture of the Tensile Bar	393
<i>J.A. Nemes and J. Eftis</i>	
Comparative Viscoplastic FE-Calculations of a Notched Specimen Under Cyclic Loadings	397
<i>J. Olschewski, R. Sievert, and A. Bertram</i>	
Dynamic Ductile Failure Under Multi-Axial Loading	401
<i>A.M. Rajendran, S.J. Blëss, and D.J. Grove</i>	
Damage and Viscoplasticity Effects in the Indentation of a Polycrystalline Solid	405
<i>A.P.S. Selvadurai and M.C. Au</i>	
Theory and Finite Element Computation of Finite Elasto-Visco-Plastic Strains	409
<i>E. Stein and C. Miehe</i>	
Generated Force and Deformation at a Conical Impact-End of Aluminum Bar	413
<i>S. Tanimura</i>	
A Constitutive Equation Describing Strain Hardening, Strain Rate Sensitivity, Temperature Dependence and Strain Rate History Effect	417
<i>S. Tanimura and K. Ishikawa</i>	

Some Basic Properties of Constitutive Models in Plasticity and Viscoplasticity	421
<i>C. Tsakmakis and P. Haupt</i>	

Yielding of Mild Steel After Hydrostatic Pressurization	425
<i>F. Yoshida, M. Itoh, and M. Ohmori</i>	

CYCLIC PLASTICITY

Limit Response in Cyclic Plasticity	431
<i>S. Akel and Q.S. Nguyen</i>	

A Three Dimensional Cyclic Constitutive Law for Metals with a Semi-Discrete Memory Variable	435
<i>S. Andrieux and S. Taheri</i>	

Rate-Dependent Plastic Deformation-Experiments and Constitutive Modelling	439
<i>F. Ellyin, Z. Xia, and K. Sasaki</i>	

Ratchetting Strains in Cyclic Plastic Bending	443
<i>S.J. Harvey, D. Elcock, and A.P. Toor</i>	

High Temperature Plastic Behavior of IN738LC Under LCF Loading	447
<i>F. Jiao, W. Chen, J. Zhu, and R.P. Wahi</i>	

A New Model for a Representation of Hardening Properties in Cyclic Plasticity	451
<i>M. Kamlah, C. Tsakmakis, and P. Haupt</i>	

Nonlinear Kinematic Hardening Rule with Critical State for Activation of Dynamic Recovery	455
<i>N. Ohno and J.-D. Wang</i>	

A Damage Cumulation Law Under Non Proportional Cyclic Loading with Overloads for the Prediction of Crack Initiation	459
<i>S. Taheri</i>	

Numerical Predictions of Bauschinger Curves and Cyclic Loading Curves with the Lin's Polycrystal Model	463
<i>H. Takahashi and N. Ono</i>	

Anisotropic Hardening Model and Its Application to Cyclic Loading	467
<i>W. Trampczynski and Z. Mroz</i>	

Constitutive Model for Cyclic Plasticity with Ratchetting Effects 473
G.Z. Voyiadjis and S.M. Sivakumar

Anisotropic Hardening Law of Plasticity with Cross and Rotational Effects 477
O. Watanabe

**POLYMERS, POLYMER COMPOSITES, PHASE TRANSITIONS
 AND SUPERALLOYS**

Evolution of Plastic Anisotropy in Amorphous Polymers During Finite Straining 483
E.M. Arruda and M.C. Boyce

Effects of Initial Anisotropy on the Finite Strain Deformation Behavior of Glassy Polymers 489
E.M. Arruda, H. Quintus-Bosz, and M.C. Boyce

Inelastic Anisotropic Behavior of Long Fibre Reinforced Polymer Matrix Composites 493
A.H. Cardon, R. Brouwer, L. Schillemans, and I. Daerden

A Constitutive Framework for Large Viscoelastic Deformations of Elastomers 496
Y.F. Dafalias

Continuum Modeling of Phase Transitions in Solids 500
J.K. Knowles

Anisotropic Plastic Hardening in Semi-Crystalline Polymers 504
C. G'Sell, J.M. Hiver, A. Dahoun, M.J. Philippe, and C. Esling

Modeling of the Pseudo-Elastic Behavior of Polycrystalline Shape Memory Alloys CU-ZN-AL 508
C. Lexcellent and P. Vacher

Elastic Interaction in Nickel-Based Superalloys Containing High Volume Fraction of γ' Phase 512
L. Müller, U. Glatzel, and M. Feller-Kniepmeier

Strain-Induced Transformation Plasticity in Metastable Austenitic Steels . 516
D.M. Parks and R.G. Stringfellow

Modelling Stress Relaxation and Creep in Oriented Polyethylene 520
J. Sweeney and I.M. Ward

Deformation Behavior in Elasto-Viscoplastic Polymeric Bars Under Tension	524
<i>Y. Tomita and K. Hayashi</i>	

THERMODYNAMIC CONSIDERATIONS AND THERMAL EFFECTS

On the Thermodynamics of Stress Rate in the Evolution of Back Stress in Viscoplasticity	531
<i>A.D. Freed, J.-L. Chaboche, and K.P. Walker</i>	
Constitutive Equations for Deformations Induced by Interfacial Motions	536
<i>M. Buisson, E. Patoor, and M. Berveiller</i>	
Experimental Analysis of Thermomechanical Coupling by Infra-Red Thermography	540
<i>A. Chrysochoos and J.C. Dupré</i>	
Recrystallization During High-Temperature Creep Described by a Markov-Process	544
<i>I.R. Göbel</i>	
An Exact Constitutive Solution for Thermal-Elastic-Plastic Materials	548
<i>H.K. Hong and H.-S. Lan</i>	
Preisach Model for the Hysteresis in Shape Memory Alloys	552
<i>Y.-Z. Huo</i>	
Thermodynamical Considerations on Anisotropic Deformations of Solid Bodies	556
<i>Th. Lehmann</i>	
The Thermodynamics of Elastic-Plastic Materials	560
<i>M. Lucchesi and M. Silhavy</i>	
Constitutive Equations for Metals Coupling Plasticity and Microstructural Changes	565
<i>D. Marquis</i>	
Bounding Surface Thermoplasticity and Thermoviscoplasticity	569
<i>D.L. McDowell</i>	
Equilibrium Between Coherent Phases	573
<i>I. Müller</i>	

Stability on the Yield Surface	577
<i>A. Paglietti</i>	

Inelastic Behavior of Polycrystalline Metal Under Varying Temperature Conditions	581
<i>M. Tokuda, Y. Inagaki, and F. Havlicek</i>	

METAL FORMING, STRUCTURAL ANALYSES AND COMPUTATIONAL ASPECTS

A Variationally Consistent Time Modelling of Elastic-Plastic Constitutive Equations	587
<i>G. Borino and C. Polizzotto</i>	

Determination of Ductile Crack Growth Using Gurson's Model with Different Void Evolution Laws	591
<i>W. Brocks and D. Klingbeil</i>	

The Mid-Point Rule and the Trapezoidal Rule for the Integration of the Von Mises Elastic-Plastic Constitutive Laws	595
<i>S. Caddemi</i>	

Determination of Plastic Zone at Crack Tip Using Laser Speckle Decorrelation	599
<i>F.P. Chiang and Y.Z. Dai</i>	

A Large Time Increment Approach for Cyclic Loadings	603
<i>J.-Y. Cognard and P. Ladeveze</i>	

Prediction of Fracture Initiation Using a Finite Element Method and Various Damage Models	607
<i>N.L. Dung</i>	

Generalized Yield Strength Criteria for Bar Structures	611
<i>B. Guessab and S. Turgeman</i>	

Predicting of the Residual Stress Field Created by Internal Peening of Nickel-Based Alloy Tubes	615
<i>N. Hamdane, G. Inglebert, and L. Castex</i>	

Hydroforming of Monolithic Parts to Produce RF Cavities for Particle Accelerators	619
<i>C. Hawiller</i>	

Direct Limit Analysis of Elbows by Finite Element and Mathematical Programming	623
<i>R.J. Jospin, D.H. Nguyen, and G. De Saxce</i>	
The Effect of a Temperature Cycle on the Stress Distribution in a Shrink Fit .	627
<i>A. Kovacs and H. Lippmann</i>	
Analysis of a Typical LMFBR-Structure by Means of a Component Test .	631
<i>K. Kussmaul and K. Maile</i>	
Some Problems with Contact Forces of Three dimensional Metal Forming.	635
<i>O. Mahrenholtz and J. Appeltauer</i>	
An Energetic Control on Numerical Instability for a Rate-Type Viscoplastic Oscillator	639
<i>M. Mihailescu-Suliciu and I. Suliciu</i>	
Energy Consideration for Notches in Small Scale Yielding	643
<i>A. Moftakhar and G. Glinka</i>	
Free Surface Ductility in Upsetting	647
<i>H. Moritoki</i>	
Integration Algorithm for Frictional Materials Including Plasticity, Damage and Rate Effects	651
<i>V.P. Panoskaltzis and J. Lubliner</i>	
A Theory for Planar Anisotropy in Metallic Sheets	655
<i>S.K. Samanta and N.R. Senthilnathan</i>	
Finite Elements Modelling of Elastoplastic Structures Using Self-Consistent Constitutive Relation	659
<i>E. Scacciatella, J.M. Genevoux, P. Lipinski, M. Berveiller, J.M. Detraux, and F. Horkay</i>	
Recent Developments in the Formulation and Numerical Analysis of Thermoplasticity	663
<i>J.C. Simo, C. Miehe, and F. Armero</i>	
Shakedown of Structures Undergoing Large Elastic-Plastic Deformations .	668
<i>H. Stumpf</i>	
Application of an Elastic-Plastic Finite Element Model for the Simulation of Forming Processes	672
<i>A. Van Bael, P. Van Houtte, E. Aernoudt, I. Pillinger, P. Hartley, and C.E.N. Sturgess</i>	