Some format issues inherent in the e-media version may also appear in this print version.
# Contents

**Preface**

*Modeling and Simulation of Composite and Adaptive Structures*

Session organised by C.M. Mota Soares

1. The Finite Spectral method for Composite Structures
   A.Y.T. Leung
   p. 1

2. Development of Latticed Towers Using Advanced Composite Materials
   A. Ochonski, D.J. Polyzois and I.G. Raftoyiannis
   p. 31

   J.F.P. Pitot de la Beaujardiere, E.V. Morozov and G. Bright
   p. 49

4. Damping Optimisation of Sandwich Composite Structures
   A.L. Araújo, P. Martins, C.M. Mota Soares and C.A. Mota Soares
   p. 69

5. A Layerwise Mixed Least-Squares Finite Element Model for Static Analysis of Multilayered Composite Plates
   F. Moleiro, C.M. Mota Soares, C.A. Mota Soares and J.N. Reddy
   p. 85

6. Optimisation of Composite Adaptive Response with Experimental Validation
   N.L. Mulcahy, G. Prusty and C.P. Gardiner
   p. 105

7. Buckling of Ageing Elastic and Viscoelastic Beam-Columns of Composite Material
   B.F. Oliveira and G.J. Creus
   p. 122

8. Adaptive Methods for Analysis of Composite Beams and Plates with Radial Basis Functions
   p. 134

9. Analysis of Laminated Plates with Third Order Plate Theory and with the Natural Neighbour Radial Point Interpolation Method
   L.M.J.S. Dinis, R.M. Natal Jorge and J. Belinha
   p. 152

10. Effect of the Failure Criterion on the Minimum Weight of Laminated Composites
    R.H. Lopez, M.A. Luersen and E.S. Cursi
    p. 172

11. Active-Passive Damping Treatment for Elastoacoustic Problems
    J.F. Deü, W. Larbi and R. Ohayon
    p. 187

12. Environmental Effects on the Mechanical Properties of a Graphite Plate as Related to Applications in a Fuel Cell
    p. 205
13 Evaluation of the Buckling Critical Load of Bars Subjected to their Self-Weight
A.M. Wahrhaftig, R.M.L.R.F. Brasil and M.A.S. Machado 216

14 Cost-Weight Trades for Stiffened Composite Panels Under Compression
P. Apostolopoulos and C. Kassapoglou 226

15 An Improved Numerical-Experimental Method for Damage Location in Structures
H.M.R. Lopes, J.V. Araújo dos Santos, C.M. Mota Soares, R.M. Guedes, M.A. Vaz 242

Multi-Scale Numerical Modeling of Engineering Structures
Session organised by J.Q. Ye and Y. Sheng

16 Three-Dimensional Coupled Discrete Element - Finite Element Model: Parameter Identification and Coupling with Shells
J. Rousseau, E. Frangin, P. Marin, L. Daudeville and S. Potapov 257

17 Distinct Element Modelling of Masonry Wall Panels with Openings
V. Sarhosis, S.W. Garrity and Y. Sheng 267

D.M. Yang, Y.Q. Tan, J.Q. Ye and Y. Sheng 282

Numerical Design of Protective Structures
Session organised by N. Gebbeken

19 Architectural Concepts to Reduce the Effects of Explosions
N. Gebbeken and T. Döge 291

20 Ballistic Resistance of Double-Layered Metal Plates
T. Børvik, S. Dey, O.S. Hopperstad, T. Wierzbicki and X. Teng 305

21 Numerical Safety Assessment of a Transport and Storage Cask for Radioactive Materials without Impact Limiters by the 0.3m Drop Test onto an Unyielding Target
L. Qiao, U. Zencker, G. Wieser and H. Völzke 320

22 Simulation of the Crushing of Wood Filled Impact Limiters for Packages of Radioactive Material
M. Neumann and F. Wille 330

Modelling of Composite Beams
Session organised by J. Murin

23 A Geometric Nonlinear Sandwich Composite Bar Finite Element with Transversal and Longitudinal Variation of Material Properties
R. Ďuriš and V. Goga 351

24 An Effective Multiphysical Functionally Graded Material Beam-Link Finite Element with Transversal Symmetric and Longitudinal Continuous Variation of Material Properties
J. Murin, V. Kutiš and M. Masný 363

25 Stability of a Composite Beam-Column with Transversal and Longitudinal Variation of Material Properties
V. Kutiš and J. Murin 386
26 Analytical Calculation of Composite Beams According to Second Order Theory
M. Aminbaghai and R. Binder

27 The Shear Deformation Effect in the Flexural-Torsional Vibration of Composite Beams Using the Boundary Element Method
E.J. Sapountzakis and J.A. Dourakopoulos

Mechanics of Composites, Functionally Graded and Piezoelectric Materials
Session organised by T. Kant

28 Axisymmetric Bending of Thick Functionally Graded Circular Plates Using Fourth-Order Shear Deformation Theory
S. Sahraee and A.R. Saidi

29 On Non-Linear Vibration of Laminated Composite Piezoelectric Plates
M. Tanveer and A.V. Singh

30 A Shear-Deformation Theory for Composite and Sandwich Plates Using Improved Zigzag Kinematics
A. Tessler, M. Di Sciuva and M. Gherlone

31 Electromechanical Response of Piezoelectric, Functionally Graded and Layered Composite Cylinders
T. Kant and P. Desai

32 Thermal Buckling Analysis of Thick Functionally Graded Circular Plates Using Unconstrained Third-Order Shear Deformation Plate Theory
A.R. Saidi and S. Sahraee

33 Material Forces for Simulation of Brittle Crack Propagation in Functionally Graded Materials
R. Mahnken

34 Finite Element Analysis of Crack Initiation in PZT Transducers
J. Novak

35 Modeling with Uncertainty and Robust Control of Smart Beams
A. Moutsopoulou, A. Pouliezos and G.E. Stavroulakis

36 Mesh Generation for Cavity Damage Identification in Piezoelectrics
R. Palma, G. Rus, J.L. Pérez-Aparicio and R. Gallego

Spectral and Wave Element Methods for Structural Response Prediction and Damage Detection
Session organised by J.R. Arruda

37 Models of Space Energetics of Coupled Plates for High Frequency Vibrations
V.S. Pereira and J.M.C. Dos Santos

38 Vibration and Wave Propagation Approaches Applied to Assess Damage Influence on the Behavior of Euler-Bernoulli Beams: Part I Direct Problem

39 Vibration and Wave Propagation Approaches Applied to Assess Damage Influence on the Behavior of Euler-Bernoulli Beams: Part II Inverse Problem

40 Modelling Wave Propagation in Laminated Composite Structures
G. Inquiété, P. Saad, B. Petitjean, B. Troclet, M.N. Ichchou and L. Jezequel
<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td>Building Spectral Elements from Finite Element Models of Waveguide Slices</td>
<td>J.R.F. Arruda and R.F. Nascimento</td>
</tr>
<tr>
<td>42</td>
<td>Dynamic Stiffness Matrix of an Axisymmetric Shell and Distributed Loads</td>
<td>M.A. Khadimallah, J.B. Casimir, M. Chafra and H. Smaoui</td>
</tr>
<tr>
<td>43</td>
<td>Spectral Element Modeling for the Dynamics of Flexible Rotor Systems</td>
<td>J. Lee and U. Lee</td>
</tr>
<tr>
<td>44</td>
<td>Wave Finite Element Method for Modelling of Constrained Layer Damping Treatment in Laminated Plates</td>
<td>E. Manconi and B.R. Mace</td>
</tr>
</tbody>
</table>

**Evolutionary and Non-Deterministic Methods in Structural Optimization**

Session organised by M. Domaszewski

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>Evolutionary Computation Based Optimum Design for Non-Linear Elastic Steel Frames</td>
<td>G. Sánchez and P. Martí</td>
</tr>
<tr>
<td>48</td>
<td>Optimum Design of Unbraced Steel Frames to the LRFD-AISC Code Using Particle Swarm Optimization</td>
<td>E. Doğan and M.P. Saka</td>
</tr>
<tr>
<td>50</td>
<td>A Harmony Search Algorithm for Optimum Topology Design of Single Layer Lamella Domes</td>
<td>S. Carbas and M.P. Saka</td>
</tr>
<tr>
<td>51</td>
<td>Optimization of Truss and Grillage Structures by a Non-Deterministic Method</td>
<td>D. Chamoret, K. Qiu, N. Labeled and M. Domaszewski</td>
</tr>
</tbody>
</table>

**Stochastic Optimization Methods in Structural Analysis and Optimal Design**

Session organised by K. Marti and G.I. Schüeller

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>52</td>
<td>Approximative Solutions of Stochastic Control Problems by Means of Convex Approximation</td>
<td>K. Marti</td>
</tr>
<tr>
<td>53</td>
<td>Optimal Design of Trusses Considering Uncertainty: A Comparison of Two Approaches</td>
<td>S. Zier</td>
</tr>
<tr>
<td>54</td>
<td>Fuzzy Probabilistic Models in Structural Reliability</td>
<td>A. Omishore, Z. Kala and L. Puklický</td>
</tr>
<tr>
<td>55</td>
<td>Sensitivity Analysis of Computer Models of Structures with Green’s Functions</td>
<td>F. Hartmann and T. Kunow</td>
</tr>
<tr>
<td>56</td>
<td>Optimal Control of Robots in the Case of Random Initial Conditions</td>
<td>M. Schacher</td>
</tr>
</tbody>
</table>
57 Efficient Strategies for Solving Reliability-Based Optimization Problems
M.A. Valdebenito and G.I. Schuëller

58 Seismic Safety Assessment of the Tower of the S. Maria Maggiore Cathedral in Guardiarele, Italy
G. Camata, L. Cifelli, E. Spacone, J. Conte, M. Loi and P. Torrese

59 Assessment of Design Recommendations for Torsionally Unbalanced Structures Using Structural Optimization
N. Bakas, N.D. Lagaros and M. Papadrakakis

60 Optimum Design of Arch Dams Including Hydrodynamic Effects for Earthquake Loading Using the Simultaneous Perturbation Stochastic Approximation Method
J. Salajegheh, E. Salajegheh, S.M. Seyedpoor and S. Gholizadeh

61 Multi-Objective Seismic Design of Reinforced Concrete Buildings
St. Tsivouraki, N.D. Lagaros and M. Papadrakakis

62 Artificial Intelligence Techniques in the Simulation of Viscoplasticity of Polymeric Composites
M.S. Al-Haik, M.Y. Hussaini and C.S. Rogan

63 Plastic Collapse Analysis of Arch Structures by Using the Differential Quadrature Element Method with a Global Secant Relaxation-Based Accelerated Iteration Procedure
C.N. Chen

64 Timoshenko Beam Structures Resting on a Two-Parameter Elastic Foundation Solved by the Differential Quadrature Element Method
C.N. Chen

65 Time Domain Analysis of Dam Reservoir Foundation Interaction Using the Differential Quadrature and Finite Difference Methods
M.R. Koohkan, R. Attarnejad and S. Aliamiri

66 Numerical Simulation of Bending Response of Reinforced Concrete and Fibre-Reinforced Concrete Beams
K.A. Georgiadi-Stefanidi, E.S. Mistakidis and P.C. Perdikaris

67 Flange and Web-Triggered Local-Distortional Mode Interaction in Cold-Formed Steel Lipped Channel Beams: Finite Element Analysis
P.B. Dinis and D. Camotim

68 A Rotating Magnetic Field for Detection of Cracks in Metal Welded Joints and Quality Control

69 Buckling Behaviour of Thin-Walled Cold Formed Steel Platforms Subjected to Bending
K.A. Tzaros and E.S. Mistakidis
A Crack Model with Delayed Embedded Discontinuities for the Numerical Prediction of Crack Widths in Concrete Structures
Y. Theiner and G. Hofstetter

The Application of an Exact Finite Strip for Calculation of Initial Post-buckling Stiffness of Channel Section Struts
H.R. Ovesy and S.A.M. Ghannadpour

Structural Analysis and Optimization in Acoustics and Vibrations
Session organised by M. Matos Neves and J.F. Aguilar Madeira

Time-Space Topology Optimization
J.S. Jensen

Plate Eigenfrequency Optimization with Genetic Algorithms and Random Keys
J.F. Aguilar Madeira, H.L. Pina and H.C. Rodrigues

Attenuation of the Flow Induced Vibration of a Plate by Topology Optimization of the Properties of the Supports
F.J.P. Lau and A.A. Gomes

Transient Topology Optimization of Two-Dimensional Elastic Wave Propagation
R. Matzen, J.S. Jensen and O. Sigmund

Detection of an Inclusion in a Membrane Using a Genetic Algorithm
D. Rabinovich, D. Givoli and S. Vigdergauz

Design of New Materials for Passive Vibration Control
T. Lopes, Z. Dimitrovová, L. Faria and H.C. Rodrigues

Optimization of $H_\infty$ Controller with Preview for Semi-active Magnetorheological Suspension Systems
R.S. Prabakar, S. Narayanan and C. Sujatha

On the Optimal Block Length of a Frequency Domain Adaptive Algorithm for an Active Noise Control System Using a Simultaneous Equations Method
K. Fujii, Y. Iwamatsu, T. Ujino and M. Muneyasu

Optimal Acoustic Design of Floors Subjected to Impact Forces
A. Neves e Sousa

Simulation of Sound Propagation between Two Closed Spaces Using the Method of Fundamental Solutions
L.M.C. Godinho, F.G. Branco and P. Amado Mendes

An Adaptive Method for State Estimation of a Sound Environment System with Unknown Structure and Fuzzy Observation
H. Masuike and A. Ikuta

Sound Power Radiated from Rectangular Plates with Unconstrained Damping Layers
J.P. Arenas and K.H. Hornig

Modelling Wave Propagation Problems in Acoustics and Vibrations Using the Boundary Element Method
P. Santos
<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>86</td>
<td>A Robust Component Mode Synthesis Method for Stochastic Vibroacoustic Problem</td>
<td>Q.H. Tran, M. Ouisse and N. Bouhaddi</td>
</tr>
<tr>
<td>87</td>
<td>Modeling a Class of Mechanical Complementary-Slackness Systems</td>
<td>Q. Feng and R.Y. Shen</td>
</tr>
<tr>
<td>88</td>
<td>A Cancellation Method of Background Noise for a Sound Environment System with Unknown Structural Characteristics</td>
<td>A. Ikuta and H. Masuike</td>
</tr>
<tr>
<td>89</td>
<td>Comparison Between Local Wall Impedance and More Refined Poroelastic Models in Vibroacoustics</td>
<td>W. Larbi, J.F. Deü and R. Ohayon</td>
</tr>
<tr>
<td>90</td>
<td>Finite Element Analysis of Surface Acoustic Waves in High Aspect Ratio Electrodes</td>
<td>M.B. Dühring, V. Laude and A. Khelif</td>
</tr>
<tr>
<td>91</td>
<td>Ultrasound Propagation in Asphalt</td>
<td>I. Chilibon and S. Velizar</td>
</tr>
<tr>
<td>92</td>
<td>Multiscale Characterisation of Urban Acoustic Diffusion Processes</td>
<td>P. Woloszyn</td>
</tr>
<tr>
<td>93</td>
<td>Micro-polar Continuum Modelling of a Lattice Structure: Theory and Experiment</td>
<td>A. Salehian and D.J. Inman</td>
</tr>
<tr>
<td>94</td>
<td>Free Vibration Analysis of Open Conical and Spherical Shells Supported on Parts of the Edges</td>
<td>S. Kandasamy and A.V. Singh</td>
</tr>
<tr>
<td>95</td>
<td>On Computational Issues for Free Vibration Response Using the Constant Hysteretic Damping Model</td>
<td>M.M. Neves and N. Maia</td>
</tr>
<tr>
<td>96</td>
<td>The Timoshenko Beam: State-of-the-Art</td>
<td>M.P. Coleman</td>
</tr>
<tr>
<td>97</td>
<td>Vibration Amplitude Maps Obtained by Non-Contact Measurement Techniques: A Survey</td>
<td>D.N. Borza and I. Nistea</td>
</tr>
<tr>
<td>98</td>
<td>A Design Method for a Cluster Control System Using a Cluster Vector Strategy</td>
<td>N. Tanaka</td>
</tr>
<tr>
<td>100</td>
<td>Modal Identification and Vibration Analyses for Noise Reduction in the CUORE Cryogenic Experiment</td>
<td>R. Ardito, C. Brofferio, C. Gargiulo and S. Morganti</td>
</tr>
<tr>
<td>101</td>
<td>Monitoring Pumping Systems Using Vibration Signal Analysis</td>
<td>S. Al-hashmi</td>
</tr>
<tr>
<td>Page</td>
<td>Title</td>
<td>Authors</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>103</td>
<td>The Wake Influence on the Vibration Behaviour of a Ship Structure</td>
<td>L. Moraru, I. Bosoanca and R. Pirvulescu</td>
</tr>
<tr>
<td>104</td>
<td>Thermal Vibrational Convection and Applications</td>
<td>V.A. Demin, I.A. Babushkin and A.F. Glukhov</td>
</tr>
<tr>
<td></td>
<td><strong>Probabilistic Approaches and Optimisation for Structural Mechanics</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Session organised by A. Elhami and M. Karama</td>
<td></td>
</tr>
<tr>
<td>105</td>
<td>Topology Optimization Based on the Level-Set Method for Passive Damping of Structures</td>
<td>S. Bouzidi, M.L. Bouazizi, M. Guedri and N. Bouhaddi</td>
</tr>
<tr>
<td>107</td>
<td>Reliability Based Design Optimisation of Laminated Composite Plates</td>
<td>R.H. Lopez, J.E. Rojas, E.S. Cursi and A. El-Hami</td>
</tr>
<tr>
<td>109</td>
<td>Probabilistic Analysis of Buckling Loads of Bridges</td>
<td>K. Ikeda</td>
</tr>
<tr>
<td>110</td>
<td>Structural Optimization Using a Stochastic Method</td>
<td>W. Elalem, A. El Hami and R. Ellaia</td>
</tr>
<tr>
<td>111</td>
<td>Acceleration-Based Optimum Design of Offshore Platforms Subjected to Ice Loading</td>
<td>G. Li, X. Liu and G.D. Cheng</td>
</tr>
<tr>
<td>112</td>
<td>Convergence Control of Structural Optimization and Reliability Analysis Algorithms Based on Chaos Theory</td>
<td>D.X. Yang and G.D. Cheng</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Damage Identification</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Session organised by C.A. Papadopoulos</td>
<td></td>
</tr>
<tr>
<td>113</td>
<td>A Coherence Analysis Based Approach for Locating Nonlinear Components in Multi-Degree of Freedom Systems</td>
<td>Z.Q. Lang and Z.K. Peng</td>
</tr>
<tr>
<td>114</td>
<td>Damage Identification Using Uniform Random Load Surface Spectral Strain Energy</td>
<td>W.L. Bayissa and N. Haritos</td>
</tr>
<tr>
<td>115</td>
<td>Damping Associated with Porosity in Porous Rectangular Plates</td>
<td>K.M. Stamatopoulos, I.T. Chondrou and S.D. Panteliou</td>
</tr>
<tr>
<td>117</td>
<td>Damage Analysis of Metallic Open-Lattice Cellular Cores Under Static and Dynamic Loading</td>
<td>G.N. Labeas, M.M. Sunaric and V.P. Ptochos</td>
</tr>
<tr>
<td>Page</td>
<td>Title</td>
<td>Authors</td>
</tr>
<tr>
<td>-------</td>
<td>----------------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>118</td>
<td>Fault Diagnosis of Journal Bearings Based on Artificial Neural Networks and Measurements of Bearing Performance Characteristics</td>
<td>K.M. Saridakis, P.G. Nikolakopoulos, C.A. Papadopoulos and A.J. Dentsoras</td>
</tr>
<tr>
<td>119</td>
<td>Applying External Excitation to a Rotor for Wear Identification of the Non-Linear Fluid-Film Bearings</td>
<td>P.G. Nikolakopoulos, A.C. Chasalevris and C.A. Papadopoulos</td>
</tr>
<tr>
<td>120</td>
<td>Wear Identification in Rotor-Bearing Systems by Volumetric and Bearing Performance Characteristics Measurements</td>
<td>K.P. Gertzos, P.G. Nikolakopoulos, A.C. Chasalevris and C.A. Papadopoulos</td>
</tr>
<tr>
<td>121</td>
<td>Cracked and Unbalanced Rotating Shaft Behaviour During Start Up: Analyzing the Response by Conventional Fourier Transform and Wavelets</td>
<td>J.C. Gómez-Mancilla and J.A. Meda-Campaña</td>
</tr>
<tr>
<td>122</td>
<td>Crack Identification Using External Excitation and Coupled Response of a Continuously Modeled Rotor with Internal Damping, Mounted on Nonlinear Fluid Film Bearings</td>
<td>A.C. Chasalevris and C.A. Papadopoulos</td>
</tr>
<tr>
<td>123</td>
<td>Non-Linear Vibration Technique for Crack Detection in Beam Structures Using Frequency Mixing</td>
<td>K. Zacharias, E. Douka, L.J. Hadjileontiadis and A. Trochidis</td>
</tr>
<tr>
<td>124</td>
<td>Crack Identification in Vibrating Beams and Fracture Mechanics Applications</td>
<td>T.G. Chondros</td>
</tr>
<tr>
<td></td>
<td><strong>Computational Tools for Earthquake and Structural Dynamics</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Session organised by S.H. Lo</td>
<td></td>
</tr>
<tr>
<td>125</td>
<td>Open Issues in Retaining Wall-Soil-Structure Dynamic Interaction</td>
<td>G. Papazafeiropoulos, Y. Tsompanakis and P.N. Psarropoulos</td>
</tr>
<tr>
<td>127</td>
<td>Computational Tools for Analysis of Responses to Transient Loading</td>
<td>N.T.K. Lam and H.H. Tsang</td>
</tr>
<tr>
<td>130</td>
<td>Implementation of a Low-Cost Structural Dynamics Investigative System</td>
<td>N. Haritos</td>
</tr>
<tr>
<td></td>
<td><strong>Non-Linear Dynamics</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Session organised by M. Amabili</td>
<td></td>
</tr>
<tr>
<td>131</td>
<td>Nonlinear Vibrations of Plates with Fluid-Structure Interaction</td>
<td>M. Amabili and S. Carra</td>
</tr>
</tbody>
</table>
132 The Dynamic Analysis of Beams Subjected to Large Amplitude Transverse Vibrations 2016
F.Q. Melo, R. Valente and R.C. Barros

133 Nonlinear Stability of Shells Conveying Fluid Flow 2037
M. Amabili, K. Karagiozis and M.P. Païdoussis

Finite Element Methods

134 A New Triangular Flat Shell Element with Drilling Rotations 2050
L. Damkilde

135 The Wavelet-Based Theory of Spatial Naturally Curved and Twisted Linear Beams 2060
E. Zupan, D. Zupan and M. Saje

Finite Elements: Plasticity

136 Strict Bounds for Quantities of Interest for Plasticity Problems 2082
M. Wynant, P. Ladevège and E. Florentin

Finite Elements: Modelling and Design

137 A Study of the Dynamic Behaviour of a Typical Indian Railway Track System 2092
K. Ganesh Babu and C. Sujatha

138 Strength Shaping of Dished Heads of Pressure Cylindrical Vessels 2103
L. Wittenbeck and K. Magnucki

139 Inelastic Buckling of Geometrically Imperfect Tubes under External Hydrostatic Pressure 2113
A.P.F. Little, C.T.F. Ross, D. Short and G.X. Brown

140 Numerical and Experimental Study into Behaviour of Cylinders Under Edge Shear Force and External Pressure 2129
J. Błachut and O.R. Jaiswal

141 Plastic General Instability of Ring-Stiffened Conical Shells under External Pressure 2152
C.T.F. Ross, A.P.F. Little and G. Andriosopoulos

142 Structural Behaviour of Expanded Metal Sheets 2170
G. Martínez, C. Graciano, E. Casanova and O. Pelliccioni

143 Collapse of Carbon-Glass Composite Tubes under Uniform External Pressure 2180
C.T.F. Ross, A.P.F. Little, Y. Haidar and A. Al Waheeb

Boundary Element Methods

144 Prediction of Low Frequency Sound Transmission by a Vibrating Single Structure 2200
P. Santos and D. Mateus

145 Nonlinear Elastic Nonuniform Torsion of Bars of Arbitrary Cross Section Using the Boundary Element Method 2217
E.J. Sapountzakis and V.J. Tsipiras

146 Elastoplastic Boundary Element Method Formulation for Plates with Geometrical Non-Linearity 2237
L. Waidemam, W.S. Venturini and H.B. Coda
147  A Boundary Element - Differential Equation Method Coupling for Plate-Beam Interaction  
J.B. Paiva and A.V. Mendonça  2250

Plate Problems

148  Elasto-Plastic Post-Buckling Strength of Uniformly Compressed Plates  
M. Rosmanit  2260

149  A Refined Five-Node Transition Plate Bending Element Based on Kirchhoff Plate Theory  
H. Gedikli and H. Sofuoglu  2274

150  On the Spurious Mechanisms of an Eight-Node Mindlin Plate Finite Element Model  
J.E. Abdalla Filho, I.M. Belo and R.D. Machado  2289

Damage and Identification Problems

151  An Approach to Automated Modal Parameter Identification for Structural Health Monitoring Applications  
C. Rainieri, G. Fabbrocino and E. Cosenza  2310

152  Finite Element Analysis of Periodic Structures and their Application for Structural Health Monitoring  
W.J. Zhou and M.N. Ichchou  2322

153  Anisotropic and Unilateral Damage: Application to Concrete  
O. Bélaidi Chabane Chaouche, Y. Labadi and N.E. Hannachi  2331

154  Inference Models for Structural Systems Integrity Monitoring: Neural Networks and Bayesian Enhancements  
S. Arangio  2348

155  A Method for the Deterministic and Stochastic Time Domain Identification of Structures  
P. Cacciola, N. Maugeri and G. Muscolino  2369

156  Modal Material Identification Method Using a Dissipative Finite Element Model  
M. Matter, Th. Gmü, J. Cugnoni and A. Schorderet  2387

157  An Anisotropic Damage Model for Concrete in Coupled Problems  
T. Koudelka and T. Krejčí  2405

158  Structural Analysis of Corroded Pipelines Containing Complex Defects  
R.D. Machado, J.E. Abdalla F. and H.Y. Shang  2416

Shakedown Analysis and Design

159  Optimal Shakedown Design of Frames Under Stability Conditions  
J. Atkočiūnas and A. Venskus  2434

160  A Static Shakedown Theorem for Materials with Temperature-Dependent Elastic Modulus  
A. Oueslati and G. de Saxcé  2446

161  Reliability Based Limit Analysis and Shakedown of Framed Structures with Limited Residual Strain Energy Capacity  
J. Lógo, M. Movahedi Rad, J. Knabel and Z. Hortobágyi  2458
### Analysis of Trusses, Frames and Space Structures

- **162** Displacement and Force Control in Pin-Jointed Assemblies  
  A.S.K. Kwan  
  Page: 2472

- **163** Planar Truss Structures with Multi-Symmetry  
  A. Kaveh and L. Shahryari  
  Page: 2485

- **164** A New Approach for the Analysis of Bending Elements with Variable Thickness  
  R. Attarnejad and S. Aliamiri  
  Page: 2511

- **165** Coupling Dynamic Buckling Analysis of Framed Structures Using a Spline Finite Element  
  H. Yang and A.Y.T. Leung  
  Page: 2519

- **166** Interrelation of Group Products and Graph Products in Configuration Processing of Symmetric Structures  
  A. Kaveh and M. Nikbakht  
  Page: 2538

- **167** The Nonlinear Analysis of Frames with Semi-Rigid Connections and Shear Deformations  
  H. Görgün and S. Yılmaz  
  Page: 2556

- **168** An Enhanced Positional Finite Element Formulation for Geometrical Non-Linear Analysis of Three-Dimensional Laminate Frames  
  H.B. Coda  
  Page: 2569

- **169** Estimation of Critical Flutter Load of a Cracked Shaft Simultaneously Subjected to a Follower Force with an Axial Force  
  I. Takahashi  
  Page: 2588

### Structural Optimization

- **170** Response Surface Based Structural Optimization with Single-Cut Strategy for Fuzzy Limit Problems  
  C.J. Shih and H.W. Lee  
  Page: 2606

- **171** Optimisation of the Computational Dimensioning Process with Consideration of Manufacturing Aspects  
  K. Thielemann  
  Page: 2626

### Shape and Topology Optimization

- **172** Shape and Size Optimisation of Concrete Shells Respecting the Original Design Form  
  A. Tomás and P. Martí  
  Page: 2637

- **173** Numerical Design Optimisation for the Karoo Array Telescope  
  N.J.D. Joubert and G. Venter  
  Page: 2649

- **174** Topology Optimization of Trusses Modeled Similar to Truss-like Structures  
  V. Pomezanski  
  Page: 2668

- **175** Three-Dimensional Structural Shape Optimisation Incorporating Surface Point Mapping  
  G. Baylor and D. Kelliher  
  Page: 2679

- **176** Topology Optimization Using the Optimality Criterion Method  
  M.A. Hendel and K.Z. Truman  
  Page: 2699
177 Optimization of Contact Problems Using a Topology Derivative Method
A. Másliński

Reliability Design

178 Road Tankers Load Distribution Design and Rollover Stability Simulation
A.S. Papadogiannis, P. Michaelides, G. Michalos and T.G. Chondros

179 Probabilistic Parametric Analysis of the Thermal Conducting LTCC Substrate for an LED Lamp
S.C. Lin, R.F. Huang, C.C. Lin and Y.T. Lin

Reliability Analysis and Modelling

180 Stochastic Finite Element Stability Analysis of Shells with Non-Gaussian Material and Thickness Properties
G. Stefanou, V. Papadopoulos and M. Papadrakakis

181 Solving the Dynamic Reliability Equations of the Theory of Stimulated Dynamics
I. Cañamón and J.M. Izquierdo

182 A Time-Variant Reliability Approach for Ageing Marine Structures with Non-Linear Behaviour
J.Y. Cognard, M. Mejri and M. Cazuguel

Probabilistic Engineering Problems

183 Numerical Structural Monitoring for Textile Strengthened Reinforced Concrete Structures
F. Steinigen, W. Graf, M. Kaliske and J.-U. Sickert

Dynamics and Vibration

184 Computational Modelling of the Static and Dynamic Behaviour of Wind Turbine Tower Structures

185 Model Reduction in Finite Element Analysis for a Fluid Filled Pipe Using an Orthogonal Vector Set
R.J. Alkhoury, M.H. Chikhalsouk, R.B. Bhat and K.D.P. Nigam

186 Dynamic Analysis of the High Speed Steel Bars Cutting Structure
J. Benčat and D. Papán

187 Estimation of the Dynamic Validity Range of Linearised Structural Mechanical Models
M. Lazanowski, H. Kärcher, H. Li, S. Kern and M. Schäfer

188 Validation of Simulation Approaches for Catenary-Pantograph Dynamics
J.R. Jimenez-Octavio, M. Such, A. Carnicero and O. Lopez-Garcia

189 Estimation of an Active Boring Bar’s Control Path Frequency Response Functions by Means of its Three-Dimensional Model with Coulomb Friction
T. Smirnova, H. Åkesson, L. Håkansson, I. Claesson and T. Lagö

190 Analytical Solutions for Vibrating Fractal Rods
M.T. Alonso Rasgado and K. Davey

191 The Fractal Generalized Finite Difference Method in Elastodynamics
G.M. Cocchi and P. Tiriaca
Passive Damping Systems

192 Rheological-Dynamical Theory of Vibrations of Multi-Degree-of-Freedom Structures: Design of Viscoelastoplastic Dampers
D.D. Milašinović and A. Borković

193 Optimization of the Location and Damping Constants of Viscous Dampers
R. Lewandowski

194 A New Bidirectional Rolling Tuned Mass Damper for the Wind Control of Tall Buildings
E. Matta

Seismic Engineering

195 Contribution to Reliability Assessment of Concrete Dams under Dynamic Effects
R.C. Silva and L.J. Pedroso

196 Seismic Analysis of Plane Frame Structures
D. Mestrovic and L. Miculinic

197 Automated Baseline Correction, Fling and Displacement Estimates from the Chi-Chi Earthquake using the Wavelet Transform
A.A. Chanerley and N. Alexander

198 Optimization of Masonry Infilled Reinforced Concrete Buildings
I.A. Naziris, N.D. Lagaros and M. Papadrakakis

199 Fragility Based Critical Assessment of Design Codes
Ch.Ch. Mitropoulou, N.D. Lagaros and M. Papadrakakis

200 Dynamic Analysis of Cylindrical Roof Shells for Earthquake Resistant Design
S. Ostovari Dailamani and J.G.A. Croll

201 Minimizing the Uncertainties of Seismological-Geotechnical Source Parameters using a Genetic Algorithm Approach
A. Nicknam, R. Abbasnia, M. Bozorgnasab, Y. Eslamian, A. Nicknam

202 High Performance Computing Applied to the Seismic Finite Element Analysis of an Historic Structure: The Temple of Athena in Paestum
G. Zaccone and L. Stendardo

203 Estimating the Seismological Source Parameters of the 2006 Silakhor Earthquake, Iran, Using a Genetic Algorithm
A. Nicknam, R. Abbasnia, Y. Eslamian, M. Bozorgnasab and A. Nicknam

204 Roof-Garden Tuned Mass Dampers for Seismic Mitigation: The Translational and the Pendulum Alternatives
E. Matta and A. De Stefano

205 The Dynamic Response of Seismic Intensity Indicators
C.S. Belsham

Wave Propagation Problems

206 A New Consistent Mass Matrix for Timoshenko’s Flexural Model
J.E. Laier and C.C. Noronha
Contact-Impact Problems

208 Simulation of a Foreign Object Damage Test on a Silicon Nitride Specimen
   R. Dotoli, D. Lisi, D. Bardaro and O. Manni

209 Modelling of Glass Fibre Composites Subjected to Low Velocity Impact
   J. Fan, Z.W. Guan and W.J. Cantwell

210 Equilibrium Configurations of Heavy Elastica Beams Under Unilateral Contact Constraints
   M. Abdel-Jaber, S. Al-Sadder, A. Shatnawi and M. Mahdi

211 Simulation of Contact Among Rigid Surfaces by Using Short Range Force Fields
   A. Contento, A. Di Egidio and A. Tatone

Steel Structures

212 Restraining Progressive Collapse of Pallet Rack Structures
   A.L.Y. Ng, R.G. Beale and M.H.R. Godley

213 Performance Assessment of Steel Structures Subject to Fire Action
   C. Crosti and F. Bontempi

214 On Welded Rail and Temperature Stressing for the Taiwan High Speed Railway
   Y.C. Shiau, L.T. Lu, C.M. Huang and T.T. Yao

215 Effect of Support Stiffeners on Columns Strengthened by Plates in Rigid Connections
   M. Foroughi and M.A. Barkhordari

216 A Finite Element Model for Three-Dimensional Steel Beam-to-Column Joints
   A. Moreno, A. Loureiro, R. Gutiérrez and J.M. Reinosa

217 Stress State and Displacements of Cold Formed Thin Walled Channel Beams
   P. Paczos, P. Zawodny and K. Magnucki

218 Sensitivity Analysis of Stability Problems with Steel Plane Frames
   Z. Kala, A. Omishore and L. Puklický

219 Buckling Behaviour of Steel Columns Subjected to Fire
   T. Hozjan, I. Planinc, M. Saje and S. Srpčič

220 Analytical Evaluation of Local Buckling Behaviour in Square Steel Tube Members
   T. Ohtsuka and S. Motoyui

Reinforced Concrete Structures: Design

221 A Study on the Application of Expansion Anchor Reinforcement in Construction Engineering
   Y.C. Shiau, C.S. Huang and P.L. Yen

222 Stress-Strain Material Diagrams for Profiled Steel Sheeting Reinforcement for In-Situ Cast
   Concrete Slabs
   E. Chaparanganda
223 The Stress-Strain Material Deformation Model Based Calculation Method for Normal Composite Cross-Sections
E. Chaparanganda

224 A Hybrid Approach for the Non-Linear Analysis of Reinforced Concrete Cross Sections
T. Löhnig, J. Schenk and U. Starossek

225 Two-Layer Pre-Stressed Beams Consisting of Normal and High Strength Steel Fibred Concrete
I. Iskhakov and Y. Ribakov

Reinforced Concrete: Analysis

226 Modelling of Concrete Fracture and Damage Due to High Temperatures
J. Červenka, L. Jendele and J. Surovec

227 The Influence of Elevated Temperatures on Tunnel Linings
P.P. Prochazka and S. Peskova

228 Non-Linear Bond Modelling for Reinforced Concrete
M.F.E. Eltayeb and C.T. Morley

Fibre Reinforced Concrete

229 Computational Verification of Experimental Research on Fibre Reinforced Concrete
J.R. Cigánek and A. Materna

230 Computational Research on Fibre Reinforced Concrete
J. Ciganek and A. Materna

Shell Structures

M.A. Danieli (Danielashvili)

232 A Study of the Effect of Three-Dimensional Imperfections on the Nonlinear Behaviour of Hyperboloid Reinforced Concrete Cooling Towers
A. Mutoh

233 Buckling Analysis of Shells of Revolution Under Bending Loads
P. Jasion and K. Magnucki

234 Safety of Storm-Stressed Thin Reinforced Concrete Shells in Power Industries
W.B. Krätzig, M. Graffmann, R. Harte and U. Montag

Masonry Structures

235 Analysis of Homogenized Structural Models with Input Uncertainties
A. Materna, L. Kalocova, L. Lausova and J. Brozovsky

236 Seismic Behaviour of an Unreinforced Masonry Building with Various Floor Systems
M.E. Stavroulaki and Ch.K. Amanatidou

237 Static Analysis of Masonry Structures Based on Chen Criteria
J. Brožovský and O. Sucharda
<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>238</td>
<td>Modelling the Seismic Behaviour of a Historical Masonry Building with Internal Wooden Structure</td>
<td>A.J. Morais and J.V. Lemos</td>
</tr>
<tr>
<td>239</td>
<td>Masonry Bridge Finite Element Modelling Based on Digital Photogrammetry and Ground Penetrating Radar Tests</td>
<td>I. Lubowiecka, J. Armesto, F.I. Rial and P. Arias</td>
</tr>
<tr>
<td>240</td>
<td>Stability of Double-Hinged Nonlinear Masonry Members under Combined Load</td>
<td>I. Mura</td>
</tr>
</tbody>
</table>

**Crack Propagation: Modelling**

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>241</td>
<td>Numerical Modelling of Crack Growth in Concrete Gravity Dams Based on the Discrete Crack Method</td>
<td>A.R. Lohrasbi and R. Attarnejad</td>
</tr>
<tr>
<td>242</td>
<td>An Efficient Computational Algorithm to Evaluate Fatigue Crack Growth under Variable Amplitude Loading from Strain-Life Data</td>
<td>J.T.P. Castro, M.A. Meggiolaro and A.C.O. Miranda</td>
</tr>
<tr>
<td>244</td>
<td>A Novel Implementation Strategy for Cohesive Crack Propagation</td>
<td>G. Geißler and M. Kaliske</td>
</tr>
</tbody>
</table>

**Timber Structures**

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>246</td>
<td>Lateral Buckling of Timber Arches</td>
<td>U. Rodman, I. Planinc, M. Saje and D. Zupan</td>
</tr>
<tr>
<td>247</td>
<td>Collapse Analysis of Timber Structures</td>
<td>P.H. Kirkegaard and J.D. Sørensen</td>
</tr>
<tr>
<td>248</td>
<td>Sensitivity Analysis of the Behaviour of Wood Joints Made with Double-Sided Punched Metal Plate Fasteners</td>
<td>T. Zhu and Z.W. Guan</td>
</tr>
<tr>
<td>249</td>
<td>Seismic Behaviour of Lightweight Structures</td>
<td>D. Mestrovic, V. Rajcic, D. Cizmar, M. Stepnic and L. Miculinic</td>
</tr>
</tbody>
</table>

**Microstructures: Analysis and Modelling**

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>Simulation of Fragile Structures Using the Mechanics of Continuous Damage</td>
<td>O. Bélaïdi Chabane Chaouche, M. Almansba, Y. Labadi and N.E. Hannachi</td>
</tr>
<tr>
<td>251</td>
<td>Crystal Plasticity Finite Element Modelling of Compression of Pure Aluminum</td>
<td>Z.Y. Jiang, H.J. Li, J.T. Han, D.B. Wei, H.C. Pi and A.K. Tieu</td>
</tr>
<tr>
<td>252</td>
<td>On the Dynamics of Multifield Structured Continua</td>
<td>M. Bruggi, C. Cinquinini and P. Venini</td>
</tr>
</tbody>
</table>
253 Numerical Solutions for some Axisymmetric Elastic Micropolar Orthotropic Bodies
A. Taliercio, D. Veber and A. Mola

Polyethylene Materials
254 Ring-Stiffness Evaluation and Optimization of Structured-Wall Polyethylene Pipes
F. Fuerle, J. Sienz, M. Innocente, J.F.T. Pittman, V. Samaras and S. Thomas
255 Creep Properties of Medium Density Polyethylene and High Performance Polyethylene
Z.W. Guan and J.C. Boot

Constitutive Modelling
256 A New Efficient Explicit Numerical Integration of Constitutive Equations:
Application to Sheet Metal Forming Simulations
M. Halilović, M. Vrh and B. Štok

Materials Modelling
257 Macro Modeling and Homogenization for Identification of Material Parameters to Simulate Phase
Transformations
R. Mahnken, A. Schneider and T. Andretter
258 On the Correlation of Theory and Experiment for Transversely Isotropic Nonlinear Incompressible
Solids
M.H.B.M. Shariff, B.A. Mahad and A.A. Zainal

Materials Modelling: Concrete
259 Micromechanical Modelling and Optimisation on Cement Paste Performance
V. Šmilauer, Z. Vitingarová, M. Lepš
260 Two Scale Modelling of Internally Cured Concrete by Means of Porous Media Mechanics
D. Gawin, M. Wyrzykowski and F. Pesavento
261 Numerical Simulation of Textile Reinforced Concrete Using a Microplane-Type Model with Initial
Anisotropy
A. Scholzen, R. Chudoba and J. Hegger
262 A Comparison of Computational Strategies for Two-Dimensional Analysis of Concrete Specimens
P. Konečný, M. Mynarz and J. Brožovský
263 Modelling the Effect of Chloride Binding on Chloride Diffusion in Concrete Structures
A.H. Al-Gadhib, I.A. Mahmoud, M.A. Shazali and M.H. Baluch
264 Confluence of Chloride Diffusivity Influence Functions in Unsaturated Concrete
M.A. Shazali, A.H. Al-Gadhib, M.K. Rahman and M.H. Baluch

Space Structures
265 Numerical Investigation of a New Aluminium Alloy Reticular Space Structure
A. Formisano and F.M. Mazzolani
266 Generating Geometric Configurations of Varax Domes Using Formian
U.A. Girhammar and D.H. Pan
267 Feasibility Study of a Large Span Tensegrity Spline Arch Supported Membrane
S. Adriaenssens

Cable-Net, Cable and Tension Structures

268 Limit Analysis of Inflatable Beams
J.C. Thomas, M. Chevreuil and C. Wielgosz

269 Bimodal Planar Galloping of Suspended Cables in 1:1 Internal Resonance
D. Zulli, A. Luongo and G. Piccardo

270 Simplified Numerical Experiments on the Effect of Hysteretic Damping of Cross-Ties on Cable Oscillations
P.G. Papadopoulos, A. Diamantopoulos, P. Lazaridis, H. Xenidis, C. Karayannis and S. Kyrgidis

271 Form Finding and Structural Optimization of Tension Structures Using Multi-Objective Genetic Algorithms
S.P. Triantafillou and V.K. Koumousis

272 Parameters to be Considered in the Analysis and Design of Cable Nets

273 The Series Iterative Method for Planar Rectangular Prestressed Cable Nets
R.J. Shang, Z.Q. Wu and J.L. Liu

274 Post-Elastic Analysis of Prestressed Cable Trusses
S. Kmet and M. Tomko

Offshore Structures

275 Offshore wind turbines: Basis of Structural Design
K. Gkoumas, F. Petrini, S. Manenti and F. Bontempi

Automotive Engineering

276 Validation Study of Failure Prediction in Crash Analysis
A. Reyes, C. Dørum, O.S. Hopperstad, M. Langseth, O.-G. Lademo and M. Eriksson

277 Development of a Granular-Medium-Based Energy Management System for Automotive Bumper Applications
F.-M. Mwangi and K. Kanny

Pavement Analysis and Design

278 Dynamic Analysis of a Damaged Flexible Pavement Using the Falling Weight Deflectometer Technique
A. El Ayadi, B. Picoux and C. Petit

Fire Safety Engineering

279 Safety Performance Evaluation of Steel Structures Subject to Fire Action Using Non-Linear Analysis
C. Crosti and F. Bontempi
280 Risk Analysis and Modelling Techniques for Structural Fire Safety
K. Gkoumas, C. Crosti and F. Bontempi

Bridge Engineering

281 Determination of Bridge Natural Frequencies Using a Moving Vehicle Instrumented with Accelerometers and a Geographical Positioning System
A. González, E. Covián and J. Madera

282 The Behaviour of a Long Span Suspension Bridge under the Action of Low Frequency Earthquakes
L. Bahbouh, H. Yamada, H. Katsuchi and E. Sasaki

283 Dynamic Response of a Multi-Span Continuous Bridge with a Damper Settled on a Bridge Abutment
T. Mazda, H. Miyamoto and Y. Taniguchi

284 The Old Steel Bridge: Dynamic Analysis Utilization for Estimating the Bridge Structure Ultimative Capacity
J. Benčat and D. Papán

285 Improved Modal Pushover Analysis of Multi-Span Continuous Bridges
H.G. Kwak and D.K. Shin

286 Finite Element Analysis of a Composite Steel-Concrete Bridge
T. Chaisomphob, J. Sa-nguanmanasak and E. Yamaguchi

Building Analysis and Design

287 On the Modern Use of the Bòvedas Tabicadas
S. Benfratello, A. Caffarelli, L. Palizzolo, F. Giambanco and R. Urso

288 Normal Flow Algorithm Method for Modal Adaptive Pushover Analysis of Buildings
R. Tabatabaei, H. Saffari and M.J. Fadaee

289 Application of the Digital-Image-Correlation Technique to Measure the Deformation of a Seismic Retrofitted Column for a Two-Storey Building
S.H. Tung, M.H. Shih and Y.S. Yang

290 Non-Planar Coupled Shear Walls with Stiffening Beams
E. Emsen, O. Aksogan, R. Resatoglu, M. Bikçe, H.M. Arslan and H. Görgün

291 Modeling for Progressive Collapse Mitigation Using Nonlinear Static Analysis Procedures
O.A. Mohamed and M.S. Keshawarz

Modelling Retrofitted and Repaired Structures

292 Finite Element Simulation of Reinforced Concrete Beams Strengthened with Externally Bonded Carbon Fibre Reinforced Polymer
C.A. Issa and G.A. Saad

293 Computational Analysis for Cable Supported Structures
N. Kiraç and M. Doğan

294 A Computational Stiffness Approach for Environmentally Damaged and Cable-Strengthened Metal Structures
K.A. Liolios and A.A. Liolios
### Composite Structures

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>295</td>
<td>Optimal Design of Composite Lateral Wing Upper Covers Based on Non-Linear Buckling Analysis</td>
<td>E. Barkanov, S. Gluhih, O. Ozoliņš, E. Eglītis, F. Almeida, M.C. Bowering and G. Watson</td>
<td>4415</td>
</tr>
<tr>
<td>297</td>
<td>Numerical Simulations of Ultra-Lightweight Steel-Concrete-Steel Sandwich Composite Panels Subjected to Impact</td>
<td>S.C. Lee, K.M.A. Sohel and J.Y.R. Liew</td>
<td>4441</td>
</tr>
<tr>
<td>298</td>
<td>A Global Bolted Joint Model for Finite Element Simulations of Large-scale Composite Structures</td>
<td>P.J. Gray and C.T. McCarthy</td>
<td>4454</td>
</tr>
<tr>
<td>299</td>
<td>Analysis of Two-Layer Elastic Beams Considering Interlayer Slip and Uplift</td>
<td>A. Krofič, I. Planinc, M. Saje and B. Čas</td>
<td>4471</td>
</tr>
<tr>
<td>300</td>
<td>Buckling by General Instability of Cylindrical Components of Deep Sea Submersibles</td>
<td>C.T.F. Ross, K.O. Okoto and A.P.F. Little</td>
<td>4490</td>
</tr>
<tr>
<td>301</td>
<td>Vibration of an Axisymmetric Laminated Cylinder</td>
<td>P.P. Prochazka, A.E. Yiakoumi and S. Peskova</td>
<td>4509</td>
</tr>
<tr>
<td>302</td>
<td>The Effect of Shear Connectors on the Behaviour of Steel Concrete Composite Beams</td>
<td>Y.A. Daou and O.M. Baalbaki</td>
<td>4523</td>
</tr>
<tr>
<td>303</td>
<td>Numerical Modelling of Shear Connections for Composite Slabs</td>
<td>N. Seres, A.L. Joó and L. Dunai</td>
<td>4539</td>
</tr>
</tbody>
</table>

### Composites: Damage Modelling

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>305</td>
<td>A Three-Dimensional Damage Model for Composites with Non-linear Shear Behaviour</td>
<td>C.T. McCarthy and R. O’Higgins</td>
<td>4568</td>
</tr>
<tr>
<td>306</td>
<td>A Stochastic Approach to the Damage Resistance Analysis of Stiffened Composite Panels</td>
<td>C. Sellitto, A. Riccio and D. Tescione</td>
<td>4586</td>
</tr>
<tr>
<td>307</td>
<td>A Novel Directional Damage Model for Composites</td>
<td>J.L. Curiel Sosa</td>
<td>4601</td>
</tr>
</tbody>
</table>

### Composite Materials

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>308</td>
<td>The Out-Of-Plane Natural Frequencies of Curved Composite Beams Including the Effect of the Rotary Inertia and Shear Deformation</td>
<td>B. Ayhan and F. Kadioglu</td>
<td>4610</td>
</tr>
<tr>
<td>309</td>
<td>Critical Buckling of Delaminated Composite Plates Using Exact Stiffness Analysis</td>
<td>M. Damghani, C.A. Featherston and D. Kennedy</td>
<td>4620</td>
</tr>
<tr>
<td>310</td>
<td>A Random Unit Cell Finite Element Model for the Elastic Modulus of Concrete Composites with Interfacial Transition Zone</td>
<td>S. Abdelmoumen, E. Bellenger, B. Lynge and M. Quéneudec-t’Kint</td>
<td>4634</td>
</tr>
</tbody>
</table>
311 Development of a Statistically Equivalent Representative Volume Element for a Fibre Reinforced Composite
T. Vaughan, C. McCarthy and C. Soutis

312 The Effect of Matrix Non-linearity on the Properties of Unidirectional Composite Materials for Multi-Scale Analysis
A. Keane, C.T. McCarthy and N.P. O’Dowd

313 Modelling Brittle Failure of Glass Fibre Composites Subjected to Static Loading
J. Fan, Z.W. Guan and W.J. Cantwell

314 Optimal Design of Laminated Plates with Central Circular Holes
M. Walker and M. Ndebele

315 A Numerical Model for the Bending Fatigue Behaviour of Composite Materials
E. Akay and H.S. Türkmen

316 Finite Element Modelling of Phenolic Resin Impregnated Aramid Paper Adopted in Foldcore Sandwich Cores
S. Kilchert, A.F. Johnson and H. Voggenreiter

317 Compressional Stability Behaviour of Composite Plates with Multiple Through-the-Width Delaminations by Using First Order Shear Deformation Theory
H.R. Ovesy and M. Kharazi

318 A Genetic Algorithm Based Blending Scheme for Design of Multiple Composite Laminates
O. Seresta, M.M. Abdalla and Z. Gürdal

319 Simulation of Three-Dimensional Interlock Composite Preforming
E. De Luycker, P. Boisse, F. Morestin and D. Marsal

320 Response of Circular GLARE Fiber-Metal Laminates under Lateral Indentation
G.J. Tsamasphyros and G.S. Bikakis

Author Index

Keyword Index