

# Table of Contents

## Preface, Committees

<b>The Role of Prior Fabrication and in Service Thermal Ageing on the Creep Life of AISI Type 316 Stainless Steel Components</b> A.I. Martinez-Ubeda, A.D. Warren, I. Griffiths and P.E.J. Flewitt	1
<b>Basic Research on Simulation for 3D Crack Growth by Mesh Free BFM</b> Y. Sonobe, A. Koyama and A. Saimoto	5
<b>Determination of the Impact Location and Damage Characterization Based on Guided Waves</b> A. de Luca, Z. Sharif Khodaei and F. Caputo	10
<b>A User Defined Material Model for the Simulation of Impact Induced Damage in Composite</b> A. Riccio, S. Saputo and A. Sellitto	14
<b>On the Correspondence between Two- and Three-Dimensional Elastic Solutions of Crack Problems</b> A. Kotousov, Z. He and A. Khanna	18
<b>Reliability-Based Optimization of the Stacking Sequence Layup in Post-Buckled Composite Stiffened Panels</b> C. López, O. Bacarreza, A. Baldomir, S. Hernández and M.H.F. Aliabadi	22
<b>Investigation on Damage-Involved Structural Response of Colliding Steel Structures during Ground Motions</b> B. Soltysik, T. Falborski and R. Jankowski	26
<b>Effect of Shot Peening on Fatigue Behavior of AISI 4340 in Different Loading Conditions</b> M.A.S. Torres, D.T. Harada, C.A.R.P. Baptista and M.P. Cindra Fonseca	30
<b>Online Remaining Fatigue Life Prognosis for Composite Materials Based on Strain Data and Stochastic Modeling</b> N. Eleftheroglou, D.S. Zarouchas, T.H. Loutas, R.C. Alderliesten and R. Benedictus	34
<b>Simulation of Environmentally-Assisted Material Degradation by a Thermodynamically Consistent Phase-Field Model</b> R. Falkenberg	38
<b>Numerical Investigation of the Stringer Termination Debonding in Composite Stiffened Panels</b> A. Sellitto, S. Della Corte and A. Riccio	42
<b>A Dual BEM Formulation for Thermo-Magneto-Piezo-Electric 2D Fracture Problems</b> G. Carrasco-Vela, F. García-Sánchez, A. Sáez and L. Rodríguez-Tembleque	46
<b>Effects of PVD DLC Coating on 7075-T6 Fatigue Strength at High and Low Number of Cycles</b> S. Baragetti, R. Gerosa and F. Villa	50
<b>Micromechanical Boundary Element Modelling of Transgranular and Intergranular Cohesive Cracking in Polycrystalline Materials</b> G. Geraci and M.H.F. Aliabadi	54
<b>Micromechanical Modeling of Crack Initiation and Propagation in the Ductile-Brittle Transition Region</b> G.N. Anh, G. Hütter and M. Kuna	58
<b>Experimental-Numerical Assessment of Critical SIF from VHCF Tests</b> S.H. Hasani Najafabadi, D.S. Paolino, A. Tridello, G. Chiandussi and M. Rossetto	62
<b>Characterisation of Fracture and HAC Resistance of an Individual Microstructural Constituent with Micro-Cantilever Testing</b> W. Costin, O. Lavigne and A. Kotousov	66
<b>Determination of Fracture Mechanical Properties of Carbon Bonded Alumina Using Miniaturized Specimens</b> H. Zielke, M. Abendroth and M. Kuna	70
<b>Investigations on the Fracture Toughness of Electron Beam Welded Steels</b> A.C. Hesse, T. Nitschke-Pagel and K. Dilger	74
<b>Old Suspended Timber Floors Flexurally-Strengthened with Different Structural Materials</b> H. Biscaia, N. Franco, R. Nunes and C. Chastre	78

<b>Evaluation of Fatigue Strength of Different Thickness Laser Welded S355 Steel Sheets Considering Microstructure, Surface Conditions and Residual Stresses</b> I. Černý and J. Sís	82
<b>Comparative Study of Microstructure and High Temperature Low Cycle Fatigue Behaviour of Nickel Base Superalloys Inconel 713LC and MAR-M247</b> I. Šulák, K. Obrtlík and L. Čelko	86
<b>Mixed Mode Failure Criterion for Random Composites Using a Finite Element Model</b> J. Jamali, P. Sharifi, M.J. Mahmoodi, A.H.I. Mourad and J.T. Wood	90
<b>Analytical-Numerical Determination of Stress Distribution around a Tip of Polygon-Like Inclusion</b> O. Krepl, J. Klusák and T. Profant	94
<b>Microdamage, Viscoelasticity and Viscoplasticity as Main Phenomena in Thermal Stress Relaxation in Laminated Composites</b> J. Varna, M. Persson and A. Hajlane	99
<b>Anisotropic Fatigue &amp; Fracture Behaviour in Hot-Rolled and Cold-Drawn Pearlitic Steel Wires</b> J. Toribio, B. González and J.C. Matos	103
<b>Evaluation of Piezodiagnostics Approach for Leaks Detection in a Pipe Loop</b> J. Camacho-Navarro, M. Ruiz, R. Villamizar, L. Mujica and O. Pérez	107
<b>Structural Safety Review of a Building Damaged by Explosion in Mexico City</b> J.A. Avila and J.A. Avila-Haro	111
<b>Development and Numerical Implementation of an Anisotropic Continuum Damage Model for Concrete</b> J. Hartikainen, K. Kolari and R. Kouhia	115
<b>Nonlinear Solution of Steel Arch Supports</b> L. Koubova, P. Janas and M. Krejsa	119
<b>Determination of Initial Stages of Fatigue on the Basis of Fatigue Tensile and Fatigue Bend Testing</b> N. Gubeljak and M. Cvetić	123
<b>Simulation of Lamb Wave Propagation in Composite Structures Based on the Finite Element Stacked Shell Method</b> G. Lampeas and K. Fotopoulos	127
<b>Increasing Fracture Toughness for 3D Multiscale Carbon Nanotube and Carbon Fiber Reinforced Composites</b> Y. Deng and L.Y. Tong	131
<b>Structural Health Monitoring of Bonded Patch Repaired Composite</b> F. Lambinet, Z. Sharif Khodaei and M.H.F. Aliabadi	135
<b>Using X-FEM for Progressive Damage Simulation of Laminated Composites Featuring Manufacturing Imperfections</b> L. Retschitzegger, A. Adumitroaie, S. Hörrmann and M. Schagerl	139
<b>Incorporation of a Fracture Criterion in Ideal Flow Design</b> E. Lyamina and S. Alexandrov	143
<b>Relationship between Grain Growth and Formation of Fracture Surface of Ultrafine Grained Cu in High-Cycle Fatigue</b> M. Goto, S.Z. Han, T. Yamamoto, J. Kitamura, K. Kamil, T. Fujimura and T. Yakushiji	147
<b>Plane Asymptotic Interface Crack Solutions in Gradient Elasticity Theory</b> M. Kotoul, T. Profant and P. Padělek	151
<b>3D Continuum Damage Approach for Simulation of Crack Initiation and Growth in Ceramic Materials</b> B. Michel, T. Helfer, I. Ramière and C. Esnoul	155
<b>Effect of Side Grooves on Plane Stress Fracture Behavior of Compact Tension Specimens Made of Ultra-High Strength Steel</b> M. Dabiri, T. Skriko, M. Amraei and T. Björk	159
<b>Experimental Assessment of Residual Fatigue Life of High Pressure Pipeline Section Containing Longitudinal Cracks</b> I. Černý and J. Sís	163
<b>Shear-Mode Viscoelastic Damage Formulation Interface Element</b> M.S. Goodarzi, H. Hosseini-Toudeshky and M. Jalalvand	167

<b>The Effectiveness of Polymer Damper in Damage Reduction of Temporary Steel Grandstand</b>	
N. Lasowicz and R. Jankowski	171
<b>Comparison of One-, Two- and Three-Dimensional Models of a Metallic Insert in a Composite</b>	
A. Herwig, M. Woidt and P. Horst	175
<b>Anti-Plane Interfacial Crack with Functionally Graded Coating</b>	
Y.L. Tian, M. Li and P.H. Wen	179
<b>Creep Damage and Fracture in Advanced Tungsten Modified 9%Cr Ferritic Steel</b>	
V. Sklenička, K. Kuchařová, M. Kvapilová, P. Král and J. Dvořák	183
<b>Practical Method for Estimating Time-Dependent Corrosion Depth of Uncoated Carbon Steel Plates under Various Atmospheric Environmental Conditions Using Fe/Ag Galvanic Couple Corrosion Sensor</b>	
S. Kainuma, Y. Yamamoto and Y.S. Jeong	187
<b>Optimal Sensor Positioning for Damage Detection in Composite Sensorised Panels</b>	
L. Sainfort, Z. Sharif Khodaei and M.H.F. Aliabadi	191
<b>An Unexpected Feature of a Class of Damage Evolution Models</b>	
S. Alexandrov	195
<b>Passive Sensing of Sensorized Composite Panels: Support Vector Machine</b>	
N. Yue, Z. Sharif Khodaei and M.H.F. Aliabadi	199
<b>The J-Integral for Gradient Theory of Piezoelectricity</b>	
J. Sladek, V. Sladek, C.Z. Zhang and C.L. Tan	203
<b>Analytical Approximation of Crack-Tip Stress Field: Study on Efficient Determination of Coefficients of Higher Order Terms of Williams Power Expansion</b>	
J. Sobek, P. Frantik and V. Veselý	207
<b>Influence of Residual Stresses and Particle Properties on Mechanical Response of the Material in Particulate Ceramic Composites</b>	
K. Štegnerová, L. Náhlík, P. Hutaf, P. Pokorný and Z. Majer	212
<b>Determining Cyclic Durability of Piezoceramic Structures Using Probabilistic-Structural Approach</b>	
D. Babich and T. Dorodnykh	216
<b>Mathematical Modelling of a Seismic Isolation System to Protect Structures during Damaging Earthquakes</b>	
T. Falborski, B. Sołtysik and R. Jankowski	220
<b>Influence of the Extent of Fracture on the Resistance against Chloride Penetration into Cementitious Composite</b>	
V. Veselý, P. Konečný, P. Lehner and L. Židek	224
<b>Helium Effects on 316L Austenitic Stainless Steel Fracture Mechanism</b>	
I. Villacampa, J.C. Chen, P. Spätig, H.P. Seifert and F. Duval	228
<b>Revisiting the Problem of Debond Initiation at Fibre-Matrix Interface under Transversal Biaxial Loads - A Comparison of Several Non-Classical Fracture Mechanics Approaches</b>	
L. Távara, I.G. García, R. Vodička, C.G. Panagiotopoulos and V. Mantič	232
<b>Properties of Fiber Reinforced High Performance Cement Based Overlays for Orthotropic Bridge Decks</b>	
W. de Corte, A. Jansseune, V. Boel and G. Martinola	236
<b>Effect of Plastic Deformation on Compliance Curve Based Crack Closure Measurement</b>	
M.A. Mohin, Y.G. Xu, A. Lewis and A. Chrysanthou	240
<b>Reliability Assessment of SHM Methodologies for Damage Detection</b>	
H. Tanaka and Z. Sharif Khodaei	244
<b>Model Order Reduction in Computational Multiscale Fracture Mechanics</b>	
M. Caicedo, J. Oliver, A.E. Huespe and O. Lloberas-Valls	248
<b>Server-Side Screening and Network Visualization of Huge Simulation Results</b>	
T. Yamada, K. Yodo, Y. Wada and S. Yoshimura	254
<b>A Study on Repair Technique of Vehicle Injector Parts</b>	
Y.W. Choi and D.H. Jung	258
<b>Evolution of Crack Density in Cross-Ply Laminates - Application of a Coupled Stress and Energy Criterion</b>	
M. Kashtalyan, I.G. García and V. Mantič	262

---

<b>Residual Lifetime Determination of Low Temperature Co-Fired Ceramics</b> Z. Majer, K. Štegenerová, P. Hutař, M. Pletz, R. Bermejo and L. Náhlík	266
<b>Influence of Hybrid Steel Fiber Addition on Direct Tensile Behavior of UHPC</b> S.H. Park, K.T. Koh, G.S. Ryu, G.H. An and N.K. Lee	270
<b>The Numerical Analysis for a Crack in the Cathode Electrode Surface of Planar SOFC</b> C.J. Park, J.W. Kang and O.H. Kwon	273
<b>Experimental Test of Compressive Strength after Impact Damage of Natural Composite Laminate</b> H.B. Park	277
<b>High-Temperature Structural Analysis of a Lab-Scale Alloy 800HT PCHE</b> K.N. Song, E.S. Kim and S.Y. Jang	280
<b>Influence of Compressive Stress to the Corrosion Rate of Magnesium</b> T. Kawai and N. Takano	284
<b>Temperature Robust PCA Based Stress Monitoring Approach</b> J. Quiroga, J. Quiroga, L. Mujica, R. Villamizar and M. Ruiz	288
<b>Thermal Stress in Volcanic-Ash-Deposited Thermal Barrier Coatings Monitored by Long-Range Laser System</b> M. Arai and D. Yamaura	293
<b>Measure of Nonlocal Response in Multiscale Gradient Modeling</b> T. Lesičar, Z. Tonković and J. Sorić	297
<b>Effect of the Crack Surface Friction on the Field Strength of Bi-Material-Interfacial Crack</b> Y.T. Li and L. Liu	301
<b>Studies on Mode II Rock Crack Propagation on Different Loading Environments</b> C. Cheng, M.X. Li, Y. Liu, X. Zhang, Y.Y. Cheng and X.T. Ling	305
<b>Modelling of Energy Dissipation during Fracture of Concrete Notched Beams: Proportion of the Effective Crack and the Fracture Process Zone Consumption</b> J. Klón and V. Veselý	309
<b>Fretting Wear Simulation in Fiber-Reinforced Composite Materials</b> L. Rodríguez-Tembleque and M.H.F. Aliabadi	313
<b>A Novel Numerical Formulation for Crystal Plasticity</b> I. Benedetti and V. Gulizzi	317
<b>Design of a Hybrid Lightweight Energy Absorber</b> A. de Luca, G. Lamanna, R. Sepe and A. Soprano	321
<b>Interlaminar and Intralaminar Fracture Behavior of Carbon Fiber Reinforced Polymer Composites</b> S. Haldar, C.S. Lopes and C. Gonzalez	325
<b>Flow Estimation in a Steel Pipe Using Guided Waves</b> J. Quiroga, J. Quiroga, L. Mujica, R. Villamizar and M. Ruiz	329
<b>Effect of Mean Stress on 2A12-T4 Aluminum Alloy under Tension-Torsion Constant Amplitude Loading</b> T.Q. Liu, X.H. Shi and J.Y. Zhang	334
<b>A MeshFree Micromechanical Analysis for Twill Composite</b> L. Li and M.H.F. Aliabadi	338
<b>Dynamic Crack Analysis in Functionally Graded Piezoelectric Materials by a Time-Domain BEM</b> M. Wünsche, J. Sladek, V. Sladek, F. García-Sánchez and A. Sáez	342
<b>Displacement Correlation Technique for Interface Crack by FEM</b> P. Hinneh and P.H. Wen	346