

Table of Contents

Committees	iv
Preface	viii
Nano and Micro Mechanical Measurement of Interaction Forces Between Solid Surfaces	1
K.S. Kim	
Experimental Study on Electro-Magneto-Mechanical Behaviour of Electromagnetic Solids	5
D.N. Fang, X.J. Zhao, Y.M. Pei, Z.W. Liu, F.X. Li and X. Feng	
Image Processing for Optical Methods to Analyze Shape, Deformation, Stress and Strain	13
Y. Morimoto	

I. Optical Methods and Techniques

Development of Phase Shifting Device Using the Deflection of a Cantilever for Digital Holography	19
H. Matsukawa, M. Fujigaki, T. Matui and Y. Morimoto	
Vibration Analysis of Membrane by Time Average In-Line Digital Holographic Interferometry	23
V.R. Singh and A.K. Asundi	
Effect of Phase-Shifting Error on Deformation Evaluation Using Phase-Shifting Digital Holography	27
X. Kang, X.Y. He, C.J. Tay and C. Quan	
Real-Time Shape Measurement by Unwrapping Method Using Aliasing	31
M. Fujigaki, T. Toyotake, T. Matui and Y. Morimoto	
A New Six-Step Phase Shifting Technique Using Mixed-Polariscope in Digital Photoelasticity	35
M. Ramji and K. Ramesh	
Instantaneous Spatial Phase-Stepping Methods for Phase-Measuring Interferometry and Photoelasticity	39
S. Yoneyama, M. Mizuhara, H. Kikuta and K. Moriwaki	
Investigation of Effect of Grains on Deformation of Wood under Shearing Loads Using Electronic Speckle Pattern Interferometry	43
E. Umezaki	
Optical Interferometric Inspection of Surface Contour of MEMS-Components	47
C.J. Tay, S.H. Wang and C. Quan	
Application of Wavelet Transform for Analyzing Instantaneous Contour of Continual Deformation Object	51
F.X. Chen and X.Y. He	
Analysis of Simultaneous Velocity and Density Distributions for High-Speed CO₂ Flow Using Particle Image Velocimetry and Digital Speckle Tomography	55
H.S. Ko, Y.J. Kim, O.C. Kwon and K. Okamoto	
Stress Analysis of Composite Material Embedded with Optical Fiber Sensor	59
S.C. Her and B.R. Yao	
Residual Deformation Measurement of Laser Weldment Using the Laser Interferometry	63
Z.W. Liu, D.Q. Zou, W.Z. Chen, W.N. Wang and Y. Fang	
A Simple Phase Unwrapping Approach Based on Filtering by Windowed Fourier Transform (II)	67
Q. Kemao and S.H. Soon	
Development of Combined Optical System for Thermal Analysis of Impinging Flames	71
H.S. Ko, S.S. Ahn, S.H. Baek and T. Kim	
Application of Determination of Principal-Stress Directions by Color Phase Shifting Technique to Model Containing Isotropic Points	75
P. Pinit and E. Umezaki	
Strain Analysis on Porous TiNi SMA Using SEM Moiré Method	79
H. Du, H.M. Xie, H.C. Jiang, L.J. Rong, Q.A. Luo, C.Z. Gu and Y. Zhao	

Image Reconstruction from Incomplete Data and Its Applications in Experimental Mechanics	
Y.H. Huang, Y.Y. Hung, X.Y. He and L. Liu	83
Characterization of Multipoint Diffraction Strain Sensor (MISS)	
S. Iqbal and A.K. Asundi	87
Calibration of Displacement Sensors with High-Precision and Large Measurement Range Using Temporal Speckle Pattern Interferometry	
X.D. Li and Y. Yang	91
Dynamic ESPI System for Spatio-Temporal Strain Analysis of a Deforming Solid Object	
T. Shiraishi, S. Toyooka, H. Kadono, T. Saito and S. Ping	95
Digital Speckle Projection for Vibration Measurement by Applying Digital Image Correlation Method	
F.J. Yang and X.Y. He	99
Practical Application of Picosecond Laser Micro-Machining to the Direct Fabrication of a Diffraction Grating Mold	
J.W. Noh, J.H. Lee, H.K. Sohn and J. Suh	103
Modification of the Curing Characteristics of the Photocurable Resin FA1260T for 3D Microfabrication Using Microstereolithography	
S.H. Kim, D.J. Jung, J.Y. Joo and S.H. Jeong	107
Fabrication of Superfine Electron Moiré Grid	
Y.M. Xing and S. Kishimoto	111
Microfabrication of Polymers Using KrF Excimer Laser Beam	
D.S. Shin, J.H. Lee and J. Suh	115
Characteristic Analysis and Experimental Evaluation of Fluidic Muscle Cylinder	
D.S. Kim, S.K. Bae and K.H. Choi	119
Development of Industrial SFF System Using a New Selective Dual-Laser Sintering Process	
W.H. Lee, D.S. Kim, Y.J. Ahn, B.O. Choi and K.H. Choi	123
Investigation on the Tensile Property of PC/ABS Polymer	
Q.Z. Fang, T.J. Wang and H.M. Li	127
Nano-Grating Fabrication Technique	
H.M. Xie, Z.W. Liu, M. Zhang, P.W. Chen, F.L. Huang and Q.M. Zhang	131
Displacement Smoothing and Strain Estimation Using Savitaky-Golay Filters in Digital Image Correlation	
B. Pan, H.M. Xie, T. Hua, W.N. Wang and Y. Fang	135
Deformation Measurement by a Digital Image Correlation Method Combined with a Hybrid Genetic Algorithm	
R.S. He, C.T. Horn, H.J. Wang and S.F. Hwang	139
Research on Liquid Concentration Real-Time Detecting System Based on F-P Interferometer	
W.L. Wei and X.F. Yang	143
Application of Electric Addressing Spatial Light Modulator to the Moiré Measurement	
Q. Wang, B. Wang, D.C. Ma and C.B. Yu	147
A Study on Reduction of Processing Time and Improvement of Strength by Using Photopolymer Resin in the 3DP Process	
W.H. Lee, D.S. Kim, J.S. Kim and M.C. Lee	151
Digital Image Correlation Study on Micro-Crystal of Poly-Crystal Aluminum Specimen under Tensile Load through SEM	
Z.Q. Guo, H.M. Xie, B.C. Liu, B. Pan, P.W. Chen, Q.M. Zhang and F.L. Huang	155
A New Algorithm with Distance Constraint for Large-Scale Profile Measurement	
Y.Q. Wang, N.G. Lu, W.Y. Deng and M.L. Dong	159
Development of System for Simultaneous Measurement of Stress and Temperature	
E. Umezaki and M. Abe	163
An Experimental Study on the Flow Structure inside a Display Cooler Using PIV Techniques	
C.W. Park, I.J. Baek and J.H. Yoon	167
Modification of Coherent Gradient Sensing (CGS) to Accurately Get the Fringe Order	
Y.P. Zhang, Z.G. Fan and S.W. Xu	171

Experimental and Numerical Study on Flapping Wing Kinematics and Aerodynamics of Coleoptera	175
Saputra, D.Y. Byun, Y.H. Byun and H.C. Park	
A Study on Bore-Sighting for the Error Reduction of the XK11	179
W.J. Yeo, J.W. Chae, C. Lee, E.J. Choi and J.H. Lee	
Measurement of Stress-Optical Coefficients of COC's with Different Composition	183
J.S. Kim, K.H. Yoon and J.A. Kornfield	
A Study on the Birefringence Measurement in Injection Molded Parts Using Two Different Laser Sources and R-G-B Separation of White Light	187
J.S. Kim, C.J. Hwang and K.H. Yoon	
Optical Retardation Measurement Using a Zeeman Laser	191
J.F. Lin and Y.L. Lo	
In Situ Fast Temperature Measurement of Silicon Thin Films during the Excimer Laser Annealing	195
S.J. Moon	

II. MEMS and Micromechanical Testing

Direct CTE Measurement Technique for the MEMS Materials	199
C.S. Oh, S.H. Choa, C.S. Lee and H.J. Lee	
Elastic and Plastic Mechanical Properties Determined by Nanoindentation and Numerical Simulation at Mesoscale	203
F.Y. Chen and R.C. Chang	
A Study of Nano-Indentation Test Using Rhombus-Shaped Cantilever in Atomic Force Microscope	207
K.H. Cho, H.J. Lee, J.H. Kim, J.M. Kim, Y.K. Kim and C.W. Baek	
Static and Dynamic Deformation Measurements of Micro Beams by the Technique of Digital Image Correlation	211
X.Y. He, W. Sun, X. Zheng and M. Nie	
Yield Property Characterization for Au and TiN Thin Films by Applying Nanoindentation Technique	215
Y.H. Lee, Y.H. Huh, J.Y. Kim, S.H. Nahm, J.I. Jang and D.I. Kwon	
Inverse Method to Determine Mechanical Properties of Thin Film by Nanoindentation and Finite Element Analysis	219
D.C. Baek and S.B. Lee	
Residual Stress Measurement of Porous Silicon Thin Film by Substrate Curvature Method	223
Y.X. Di, X.H. Ji, M. Hu, Y.W. Qin and J.L. Chen	
Measurement of Mechanical Properties and Residual Stresses of Bridged Gold Films and Circular Gold Membranes	227
W.S. Choi, S.T. Choi, S.U. Son, S.S. Lee, S.Y. Yang and Y.Y. Earmme	
An Experimental Method for Micro-Scale Uniaxial Tension Test	233
Z.B. Tang, F. Xu, Y.L. Li and W.J. Xu	
Measuring Strains for Hematite Phase in Sinter Ore by Electron Backscattering Diffraction Method	237
Y. Sasaki, M. Iguchi and M. Hino	
Design and Fabrication of a Flexural Plate Wave Accelerometer	241
J.S. Lee, Y.C. Kim, W.S. Lee and S.S. Lee	
A Novel PDMS Valveless Micropump with a Circular Lightweight Piezo-Composite Actuator	245
T.T. Nguyen and N.S. Goo	
Design and Performance Test of Digital Rebalance Loop for MEMS Gyroscope	249
B.S. Chang, J.G. Lee and T.S. Kang	
Dielectrophoresis of Microparticles with Planar Microelectrode Systems	253
D.F. Chen, H.J. Du, W.H. Li and H.Q. Gong	
Fine Micro Patterning of Conductive Line by Using Direct Inkjet Printing	257
S.J. Park, S.H. Seo and J.W. Joung	
Micro-Deformation Measurement on a Specular Surface by DIC with Nanoparticles	261
T.Y. Chen, I.T. Huang and B.H. Chen	

A Study on the Strength under Pressure of Micro Heat Exchanger	265
T.J. Son and Y.S. Lee	
Realization of a Chip-Level Batch Process Chemical Plant with Quantitative Performance Evaluation	
E.H. Joeng, T. Arakawa, K.C. Kim, J.S. Boo, J.S. Ko, B.S. Shin, S. Shoji and J.S. Go	269
Interfacial Residual Stress Measurement of SiC/Epoxy Composites by Microphotoelastic Method	
X.W. Yang, X.H. Ji, Y.M. Xing and Y.W. Qin	273
Correlation between Microstructure and Nanohardness in Advanced Heat-Resistant Steel	
J.I. Jang, S.H. Shim, S. Komazaki and T. Sugimoto	277
Holding Capacity of a Dielectrophoretic Barrier for Microparticles	
D.F. Chen, H.J. Du, W.H. Li and H.Q. Gong	281
Effect of Film Thicknesses of TbFe and SmFe on Magnetostrictions for Micro-Wireless Actuators	
H.S. Lee, C.D. Cho and U. Lee	285
Study on the Lateral Piezoelectric Actuator with Actuation Range Amplifying Structure	
T.M. Lee, Y.H. Seo, K.H. Whang and D.S. Choi	289
Thermal Transport Properties of Various Thin Films for MEMS Applications	
S.R. Choi, D.S. Kim and S.H. Choa	293
Surface Modification Effect of Wettability on the Performance of PDMS-Based Valveless Micropump	
W. Cho, Y.J. Ko, Y.M. Ahn, J.Y. Yoon and N.G. Cho	297
The Influence of the Temperature Increase on the Tribological Behavior of DLC Films by RF-PECVD	
Y.K. Cho, H.G. Jeon, D.H. Cho and Y.Z. Lee	301
A Study on Automation Program for the Characteristics Improvement of Optical Element Alignment System	
S.H. Jeong, G.H. Kim and K.R. Cha	305
MEMS Based Metal Plated Silicon Package for High Power LED	
S.J. Lee, J.H. Park, C.H. Lim, W.K. Jeong, S.M. Choi and Y.S. Oh	309
Size Effect on Tensile Strength of Surface-Micromachined Al-3%Ti Thin Films	
J.H. Park, M.S. Myung, Y.J. Kim, C.S. Lee, S.H. Choa and W.S. Che	313
Integrated Tunneling Device for High Sensitive Sensor Applications	
D.W. Lee, Y.S. Choi and I.K. Oh	317

III. Nano Technology

Electrostatic Ejection of Single-Walled Carbon Nanotubes Suspended in Solution	
Y.J. Kim, S.H. Lee, D.Y. Byun, S.J. Han, J.H. Yang, H.S. Ko and S.H. Baik	321
Equal Channel Angular Pressing of Carbon Nanotube Reinforced Metal Matrix Nanocomposites	
Q. Pham, Y.G. Jeong, S.H. Hong and H.S. Kim	325
Tensile Test of Individual Multi Walled Carbon Nanotube Using Nano-Manipulator inside Scanning Electron Microscope	
H.S. Jang, S.H. Kwon, A.K. Kim and S.H. Nahm	329
Synthesis of Vertically Aligned Carbon Nanotubes by dc PECVD	
Y.Y. Bang, T.J. Je, K.H. Whang and W.S. Chang	333
Explicit Time Integration Algorithm for Fully Flexible Cell Molecular Dynamics	
S.D. Park and M.H. Cho	337
Parallel Computation of Large-Scale Molecular Dynamics Simulations	
S.J. Kwon, Y.M. Lee and S.Y. Im	341
Design of a Rubber Membrane under Substrate for Nanoimprint Lithography Process	
S.W. Han, K.J. Seo, J.J. Lee, S.W. Lee, H.J. Lee and J.Y. Kim	345
Simulation Assisted Measurement of Nanoparticle Concentration Generated during High-Density Plasma CVD of Poly-Silicon Films	
T. Kim, H.S. Ko and O.C. Kwon	349
Tribological Performance of Ordered Mesoporous Carbons in Mineral Oils Under Boundary Lubricated Sliding	
S.H. Baik, J.M. Kim, K.S. Lee, D.K. Yoon, H.I. Lee and Y.Z. Lee	353

Using Nanoindentation and Nanoscratch to Determine Thin Film Mechanical Properties	357
R.C. Chang, F.Y. Chen and C.E. Sun	
Estimation of Elastic-Plastic Tensile Properties Using Nano-Indentation Tests and FE Simulations	361
Y.J. Kim, T.K. Song, J.H. Hanh and J.H. Park	
Fabrication and I-V Characteristics of Nanocrystalline Titania Electrode Sensitized by Zinc Phthalocyanine	365
Y.Q. Wang, C.P. Liu, K. Li and Y.M. Sun	
The Size and Morphology of Fine CaB₆ Powder Synthesized by Nanometer CaCO₃ as Reactant	369
L. Zhang, G.H. Min, H.S. Yu, H.M. Chen and G. Feng	
Scanning Tunneling Microscopy Studies of Porous and Oxidized Zn	373
S.S. Chang and A. Sakai	
Force Measurement by AFM Cantilever with Different Coating Layers	377
M.K. Yeh, B.Y. Chen, N.H. Tai and C.C. Chiu	
Influence of Grain Size on Magnetic Properties of Electroplated NiFe	381
M. Yusnini and I.Y. Iskandar	
Fabrication of Organic Thin Film Transistor(OTFT) Array by Using Nanoprinting Process	385
J.D. Jo, K.Y. Kim, E.S. Lee and M. Esashi	
Electro-Chemical Mechanical Deposition for Planarization of Cu Interconnect	389
S.H. Jeong, H.D. Seo, B.Y. Park, J.H. Park, S.M. Park, S.C. Kim, K.H. Kim and H.D. Jeong	
The Electrospinning Process and Mechanical Properties of Nanofiber Mats under Vacuum Conditions	393
S. Hur and W.D. Kim	
Characteristics of Nanosize Sn Powder Prepared by Spark Processing	397
S.S. Chang, H.J. Park and A. Sakai	
Design and Orthogonality Correction of a Planar Scanner for an Atomic Force Microscope	401
D.Y. Lee and D.G. Gweon	
Monitoring of Brittle-Ductile Transition during AFM Machining Using Acoustic Emission	405
S.H. Lee and B.W. Ahn	
Surface Characterization of the Milled–Silicon Nitride Nano Powders by XPS and TEM	409
D.C. Park, T. Yano, S.H. Kim, W.Y. Choi and J.H. Cho	
Computation of Fluid Film Pressures by Measuring the Elastohydrodynamic Lubrication Film Thickness with Nano-Scale Resolution	413
S.Y. Jang	
Serration Phenomena of AA5182/Polypropylene/AA5182 Sandwich Sheets	417
K.J. Kim and J.S. Kim	
Fabrication of the Fine Magnetic Abrasives by Using Mechanical Alloying Process and its Polishing Characteristics	421
S.J. Park and S.J. Lee	
Nano Manufacturing Using Fountain Pen Nano-Lithography with Active Membrane Pumping	425
Y.K. Lee, J.H. Lee, S.K. Lee, S.H. Lee, Y.J. Kim and H.M. Kim	
Microstructural Characterization of Al-Zr Alloy with Nano-Sized Grains	429
I.H. Kim, C.S. Kim, K.T. Kim and Y.H. Kim	
Influence of Ultrasound Power on the Formation of Submicron Etch Pits during Sonoelectrochemical Etching of Aluminum	433
J.W. Kang, E.S. Ko, J.K. Lee and Y.S. Tak	
Self-Organized Nanoporous Thin-Film Titania Templates Prepared by Anodic Oxidation	437
D.J. Yang, H.G. Kim and W.Y. Choi	
Single-Step UV Nanoimprinting Lithography with Multi-Head Imprinting System and Its Applications	441
J.J. Lee, S.W. Lee, H.T. Cho, G.H. Kim and K.B. Choi	
Super Fine Powderization of Korean Ginseng Using Low Temperature Turbo Mill	445
B.G. Lee, Y.H. Jeong, D.H. Cho, K.Y. Lee and W.S. Kang	
Injection Molding Nano and Micro Pillar Arrays	449
Y.E. Yoo, Y.H. Seo, S.K. Kim, T.J. Je and D.S. Choi	

IV. Reliability Engineering

A Study on Identification of Bubble Movements in an Automatic Wheel Leakage Detection System	
K.S. Boo, H.H. Yook, J.I. Lee and W.S. Che	453
Mechanical Performance of Silk-Based Structural Composites	
H.Y. Cheung and A.K.T. Lau	457
Site Experiment for Predicting Hazardous Geological Formations ahead of Tunnel Face	
C.N. Lin, Y.Y. Jiao and Q.S. Liu	461
Nondestructive Evaluation of Titanium-Nitride Ceramic Coatings	
D.J. Yang, S.J. Song, H.J. Kim, W.W. Wang and S.D. Kwon	465
Automatic Visual Inspection for Leather Manufacture	
F.Q. He, W. Wang and Z.C. Chen	469
Application of Torsional Mode of Guided Waves to Long Range Pipe Inspection	
I.K. Park, Y.K. Kim, W.J. Song and Y.S. Cho	473
Non-Contact Single-Mode Guided Wave Technique by the Combination of Wavelength-Matched Laser Generation and Angle-Matched Leak Wave Detection	
H.M. Kim, T.H. Lee and K.Y. Jhang	477
An Indentation Method Based on FEA for Equi-Biaxial Residual Stress Evaluation	
J.H. Lee and H.Y. Lee	481
Feasible Evaluation of Flow Properties and Stress State of Structural Materials Using Instrumented Indentation Tests	
J.Y. Kim, J.S. Lee, K.W. Lee, K.H. Kim and D.I. Kwon	487
Prediction of Motorized Rotating Pancake Coil Probe Signals Simulated by Numerical Analysis in SG Tubes	
J.Y. Yoo, S.J. Song, H.J. Jung, H.J. Yu, Y.H. Choi, S.C. Kang and D.H. Lee	493
Assessment of Fatigue Life for High-Temperature Pipeline Welds by Non-Destructive Method	
K.B. Yoo, H.S. Choi, E.H. Kim, S.Y. Cho and J.H. Kim	497
Using Data Mining Techniques for the Management of Seismic Vulnerability	
F. Leon, G.M. Atanasiu and D. Gâlea	501
The Design of a New Ultrasonic Horn for Flip-Chip Bonding	
W.C. Wang, S. Chen, C.H. Liu and C.Y. Ni	505
Micro Via-Hole Punching of LTCC-PET Double Layer Sheets	
S.H. Rhim, S.W. Baek and S.I. Oh	509
The Measurement of Residual Deformation in PBGA Package after Reflow Process Using A Newly Developed Laser Profiler	
I.H. Kim, J.Y. Yoon and S.B. Lee	513
Effect of High Glass Transition Temperature on Reliability of Non-Conductive Film (NCF)	
J.H. Park, C.K. Chung, K.W. Paik and S.B. Lee	517
Interconnect Design and Thermal Stress/Strain Analysis of Flip Chip Packaging	
C.M. Liu, C.C. Lee, H.T. Ku, C.C. Chiu and K.N. Chiang	521
In Situ Displacement Measurement of Flex Package Subject to Thermal Shock Conditions	
S. Yoon, S.M. Cho, Y. Lee and B.T. Han	525
Effects of Packaging Induced Stress on MEMS Devices and Its Improvements	
S.H. Choa, M.C. Lee and Y.C. Cho	529
A Novel Prediction Technique for Interfacial Crack Growth of Electronic Interconnect	
C.C. Lee, H.T. Ku, C.C. Chiu and K.N. Chiang	533
Experiment Study and Finite Element Analysis of Spring Constant of Welded Metal Bellows	
C.H. Piao, C.D. Cho, C.B. Kim and Q. Pang	537
Thermal Deformation Analysis of Exhaust Manifold for Turbo Diesel Engine	
B.K. Kim, E.H. Lee and J.S. Park	541
Statistical Assessment of Integrity in Steam Generator Tubes Considering Uncertainty of NDE	
J.B. Lee, J.H. Park, H.D. Kim, H.S. Chung and T.R. Kim	545
Reliability and Lifetime of Mechanical Units in Operation and Test	
V.B. Algin and H.E. Kim	549

On Statistical Properties of High Temperature Creep Rupture Data in STS304 Stainless Steels	
S.J. Kim, Y.S. Kong, Y.J. Roh and W.T. Jung	553
Research on 3D Geomechanics Model Test for a Large-Scale Offspur Tunnel Project	
Q.Y. Zhang, S.C. Li and X.H. Guo	557
Coupled THM Processes Modeling and Stochastic Simulation Considering Spatial Variability of Hydraulic Conductivity in Underground Storage Caverns	
C.Y. Zhang, X.Y. Liu and Q.S. Liu	561
Nondestructive Characterization of Degradation of EPDM Rubber for Automotive Radiator Hoses	
S.B. Kwak, N.S. Choi, Y.J. Choi and S.M. Shin	565
Reliability Evaluation System of Electronics Components	
S.W. Lee, S.W. Han, J.Y. Song, W.D. Kim and H.K. Lee	569
Reliability Inference for Products of Weibull Distribution by Using Artificial Neural Network Formal Description	
Y.C. Chen, P.H. Lee and C.M. Chen	573
Reliability Assessment of Systems at the All Stages of Life Cycle	
Y.L. Soliterman, O.V. Berestnev and A.M. Goman	577
Application of Integrated Design System Based on Multi-Agent to Assess Cumulative Fatigue Damage of Large Scaled Welded Structure	
S.H. Han, J.S. Bang, J.K. Lee and S.Y. Song	581
Experimental Study on Frictional Force and Wear Life of Oilless Sintered-Metal Bearings for the Reliability of the Geared Motor	
S.D. Oh, Y.H. Shin and Y.Z. Lee	585
A Study on the Fatigue Life Prediction and Evaluation of the Natural Rubber Components for Automobile Vehicles	
C.S. Woo, W.D. Kim and J.D. Kwon	589
Analysis of Practical Dynamic Load on Bus Frame with Regularized Inverse Problem	
J.H. Song, H.Y. Kang, C.W. Kim and S.M. Yang	593
Reliability Estimation of Buried Pipeline Using FORM, SORM and Monte Carlo Simulation	
O.S. Lee and D.H. Kim	597
A Life Assessment for Steam Turbine Rotor Subjected to Thermo-Mechanical Loading Using Inelastic Analysis	
W.S. Choi, E. Fleury, G.W. Song and J.S. Hyun	601
The Reliability Life Test and Analysis of Wiper Motor for Automobiles	
W.G. Shin, S.H. Lee and Y.S. Song	605
Reliability of Hermetic RF MEMS Wafer Level Packaging Using Au-Sn Eutectic Bonding	
Q. Wang, S.H. Choa, W.B. Kim, J.S. Hwang, S.J. Ham and C.Y. Moon	609
Effect of Pb Content on the Fatigue Properties of D.C. Reactive Sputtering-Derived PZT Thin Films	
D.J. Yang, S.J. Cho, J.O. Kim and W.Y. Choi	613
Wafer Level Hermetic Packaging for RF-MEMS Devices Using Electroplated Gold Layers	
G.S. Park, J.H. Yu, S.W. Seo, W.B. Choi, K.K. Paek, M.Y. Sung, H.W. Park, S.K. Yun and B.K. Ju	617
Reliability Estimation of Solder Joint by Using the Failure Probability Models	
O.S. Lee, M.J. Hur, J.S. Hawong, N.H. Myoung and D.H. Kim	621
Analysis of Hygrothermal Stress in Polymeric Thin Film Combining Laser Scanning Method and Boundary Element Method	
S.S. Lee	625
A Study on the Surface Treatments of the Barrel of Small Arms under the Firing Condition	
J.W. Chae, S.B. Lee, C. Lee, H.J. Kim and Y.S. Lee	631
A Study on Speed Elevation Possibility at the Connection between High Speed Lines and Conventional Lines with Korean High Speed Train	
Y.S. Ham and J.S. Hong	635
A Study on Maintenance Free Method for Bogie of the Freight	
J.S. Hong, Y.S. Ham, Y.N. Paik and K.Y. Lee	639
Characterization of Creep Resistance for Local Structure of Power Plant Weldment Using SP-Creep Technique	
S.S. Baek, I.H. Kwon, D.W. Lee, S.M. Yang and H.S. Yu	643

Accelerated Life Test Model for Life Prediction of Piston Assemblies in Hydraulic Pump and Motor	649
Y.B. Lee, H.E. Kim, Y.C. Yoo and J.H. Park	
Development of Accelerated Life Test Method of Pneumatic Cylinder	653
B.S. Kang, H.E. Kim, Y.C. Kwon and C.S. Song	
Identification of Load Applying on T-Shape Joint with Inverse Problem	657
J.H. Song, H.Y. Kang, H.S. Yu and S.M. Yang	
Evaluation of Internal Leak in Valve Using Acoustic Emission Method	661
S.G. Lee, J.H. Park, K.B. Yoo, S.K. Lee and S.Y. Hong	
Identification of Voids and Cracks by Ultrasonic Technique	665
S.C. Her and M.C. Chang	
A Study on the Effect of Gap Width on Residual Stresses of Laser-Welded Dissimilar Joints	669
H.S. Yang and B.C. Lee	
Advanced Technologies for Estimation of Nonlinear Ultrasonic Parameter	673
K.Y. Jhang, K. Sasaki, J. Ha and H. Tanaka	
Quantitative Evaluation of Strain Induced Martensite in STS 316L Stainless Steel	677
C.S. Kim, I.H. Kim, I.K. Park and C.Y. Hyun	
A Non-Contact Guided Wave Technique for Defect Thinning Monitoring	681
I.K. Park, Y.K. Kim, T.H. Kim and Y.S. Cho	
A Study on the Nondestructive Evaluation of Material Degradation	685
H.I. Kim, Y. Huh, J.P. Kim and C.S. Seok	
Determination of Thermal Conductivity of Amorphous Silicon Thin Films via Non-Contacting Optical Probing	689
S.J. Moon	
Characterization of the Fracture Process of a Plate-Type Piezoelectric Composite Actuator under a Bending Load by Acoustic Emission Monitoring	693
S.C. Woo and N.S. Goo	
Nondestructive Evaluation on Thermal Shock Damage of Ceramics	697
J.K. Lee, J.H. Lee and S.L. Lee	
Nondestructive Evaluation of CVD Diamond Coating Layers Using the Leaky Rayleigh Surface Wave	701
W.W. Wang, S.J. Song, H.J. Kim, D.J. Yang and S.D. Kwon	
Evaluation of Wall-Thinning in Pipes Using Laser-Generated Guided Waves	705
J.H. Park, J.H. Lee and M.R. Lee	
Elastic Property Measurement of High-Tension Bolt Based on Mode Converted Ultrasound	709
N.Y. Kim and S.S. Lee	
Enhancement of Ultrasonic C-Scan Images for Inspection of Multi-Layered Composite Panels	713
H. Cho, S.J. Song and H.J. Kim	
Experimental Study of Stress Behavior under High Temperature Using New Device by Photoelasticity Methods	717
S. Sasakir and T. Ezumie	
V. Biotechnology and Life Science	
Three-Dimensional Microfabrication System for Scaffolds in Tissue Engineering	723
S.J. Lee, B. Kim, J.S. Lee, S.W. Kim, M.S. Kim, J.S. Kim, G.B. Lim and D.W. Cho	
Novel Silk Scaffolds for Ligament Tissue Engineering Applications	727
S.L. Toh, T.K.H. Teh, S. Vallaya and J.C.H. Goh	
The Development of a Hollow Cap Thermoplastic Film for Laser Capture Microdissection with a Near Field Fiber Tip	731
C.M. Chen, C.Y. Shen, Y.C. Chen and J.A. Lee	
Hip Joint Control of PGO for Paraplegics	735
S.J. Kang, J.C. Ryu, G.S. Kim and M.S. Mun	
Human Postural Feedback Response Described by Eigenvector	739
S.Y. Kim and S.Y. Park	
Analysis of Body Pressure Distributions of the Air-Cell Mattress for Preventing Decubitus Ulcer	743
H.S. Cho, J.C. Ryu, G.S. Kim, M.S. Mun, K.H. Kim and I.H. Lee	

A Study on the Stent Expansion Behavior of the Human Artery Based on Finite Element Analysis	747
S.M. Kim and S.Y. Park	
Interaction between Finger Force and Neural Command in Multi-Finger Force Production	751
Y.H. Kim	
The Evaluation of the Lower Extremity Joint Moments and Muscle Force during Various High-Heel Walking	755
S.J. Hwang, H.S. Choi, H.H. Choi, H.S. Kim and Y.H. Kim	
Expert-Learner Based Virtual Reality Aid with Kinesthetic Interaction for Upper Limb Rehabilitation	759
J.W. Park, S.J. Lee and J.N. Cheong	
Identification of Displacement Field by X-Ray CT	765
N. Yoshikawa, S. Kuzukami and O. Kuwazuru	
Development of a Virtual Model and Experimental Simulator for the Human Cervical Spine	769
H.S. Ahn and D. DiAngelo	
Development of a 5-DOF Hybrid Micro-Manipulator and Implementation to Needle Manipulation Process in Medical Applications	773
G.B. Chung, J.H. Chung, D.G. Choi, B.J. Yi, S.Y. Han and S.J. Kim	
Biomechanical Skin Measurement System for Anlaysis Viscoelasticity	777
H.J. Kwon, Y.H. Kwon and Y.H. Kim	
Dynamic Measurement and Modeling of Soft Tissue Behavior with an Indentation Device Using Indenters of Various Shapes	781
B. An and J. Kim	
The Effect of Carbonated Apatite Powder Size on Its Embedment into Titanium Alloy by Superplastic Deformation Process	785
R.D. Ramdan, I. Jauhari, R. Hasan, N.R.N. Masdek, F.A. Zakaria and K. Jamuna	
Residual Stress in a Polymer-Glued FBG Temperature-Compensated Sensor for Civil Engineering Applications	789
A.K.T. Lau, H.Y. Au, H.Y. Ling and P.K.C. Chan	
Orthogonal Properties of Human Trabecular Bone by Spherical Indentation Test	793
T.S. Bae, T.S. Lee and K.W. Choi	
Spatial Variation in Material Properties in Fascicle-Bone Units from Human Patellar Tendon	797
K.J. Chun and D.L. Butler	
Biomechanical Research on Operations of Hangmann Fracture with Finite Element Method	803
G.B. Yang, Z.Q. Ding, K. Wu and D.F. Wang	
A Study of Lateral Curve Angle Estimation for Femoral IM Nail Design	807
J.H. Jun, S.M. Kim and S.Y. Park	
Noninvasive Imaging Technique Predicts Failure Load of the Femur with Simulated Osteolytic Defects	811
T.Y. Lee and B.D. Snyder	
Actin-Based Spring in Horseshoe Crab Sperm	815
J.H. Shin, B. Tam and S.H. Song	
The Effect of the Costal Vein Configuration of the Wings of a Dragonfly	819
K. Machida, T. Oikawa and J. Shimanuki	
Mechanics of Interactions of Helices in Proteins	823
L.L. Xin and G.S. Chirikjian	
A Conceptual Model of Micro Inertial Sensor Mimicking Amplifying Mechanism of the Hair Cells	827
K.E. Lim and S.Y. Park	
Treatment Performance of Membrane Bioreactor for Organic Acid Fermentation	831
J.O. Kim, J.T. Jung and W.Y. Choi	
Characterization of the Biomechanical Properties of the Lower Esophagus for Surgical Simulation	835
C.M. Choi, H.Y. Han, J. Kim and J.N. Cheong	
Electric Signal Detection of a Microfilter-Based Biochip for Immunoassay Using Microbead, Nanogold Particle, and Silver Enhancement	839
Y.J. Ko, C.H. Cho, J.H. Maeng, B.C. Lee, Y.M. Ahn, N.G. Cho, S.H. Lee and S.Y. Hwang	

A New Ultrasound Technique for Osteoporosis: Analysis of Broadband Attenuation Images of the Calcaneus	843
H.J. Kim and S.M. Han	
Renewable Resource Using Cellulose Derivatives by Melt Process	847
S.H. Lee, S.Y. Lee, M.S. Cho, J.D. Nam, H.R. Choi, J.C. Koo and Y.K. Lee	
Effect of Osteoporosis on Natural Frequencies in Mouse Femur: Vibration Test and Micro-CT Based Finite Element Analysis	851
Y.H. Kim, C.H. Byun and T.Y. Oh	
Plastic Ankle Foot Orthosis for Hemiplegics and Structural Analysis	855
Y.S. Lee, K.J. Choi, K.H. Cho, Y.J. Choi, H.K. Lim and B.O. Kim	
Pendulum Test and Parameters for Quantitative Evaluation of Spasticity	859
H.K. Lim, K.H. Cho, B.O. Kim and Y.S. Lee	
A Hemodynamic Study on a Marginal Cell Depletion Layer of Blood Flow Inside a Microchannel	863
C.W. Park, S.H. Shin, G.M. Kim, J.H. Jang and Y.H. Gu	
Feature Evaluation and Pattern Recognition of Lower Limb Muscle EMG during Postural Balance Control	867
H.K. Choi, J.H. Jeong, S.H. Hwang, H.C. Choi and W.H. Cho	
The Effects of Muscle Forces on Ankle Joint Kinetics during Postural Balance Control	871
H.K. Choi, M.J. Seo, J.C. Koo, H.C. Choi and W.H. Cho	
Medical Image Analysis by Robot Kinematics	875
J.B. An and L.L. Xin	
Micro Cell Incubator with On-Chip Integrated Carbon Dioxide Generator as a Self pH Controller	879
Y.H. Choi, S.U. Son and S.S. Lee	
The Effect of 3D Construction Culture of Human Chondrocytes Using Alginate Sponge	883
J.S. Lee, B. Kim, M.S. Kim, S.J. Lee, S.W. Kim, D.W. Cho, J.S. Kim and G.B. Lim	
Electrical Characteristics of Biological Active Point from Three Electrode Method	889
M.S. Kim, J.S. Lee, P.K. Kim and G.B. Lim	
Diffusion Tensor Imaging in Patients with Thalamic Hemorrhage: Correlations between Diffusion Anisotropy and Motor Recovery	895
K.S. Tae, S.J. Song, B.S. Han, S.Y. Lee, G.Y. Park, C.H. Sohn, H.S. Jeon, M.S. Choi and Y.H. Kim	
Impact Path Analysis of Human Body with Three Typical Shooting Postures	899
Y.J. Choi, Y.S. Lee, S.H. Lee, J.W. Chae, E.J. Choi and S.K. Hong	
A Computer Simulation Study of Fusion Surgery and Artificial Disc Replacement on the Human Cervical Spine	903
H.S. Ahn, I.H. Park and D. DiAngelo	
Development of Model Cell Based on the Myocardial Cell Experiments and Simulations	907
T. Tang, S.Q. Wang and Z. Zhuang	

VI. Fatigue and Fracture Mechanics

Specimen Geometry Effects on Dynamic Crack Propagation	911
K. Arakawa and T. Mada	
The Study of Optimum Shape to Evaluation for Thermal Shock Behavior of Graphite	915
S.H. Koo and Y.S. Lee	
Temperature Dependence of Threshold Stress Intensity Factor, K_{IH} in Zr-2.5Nb Alloy and Its Effect on Temperature Limit for Delayed Hydride Cracking	919
Y.S. Kim, S.B. Ahn, K.S. Kim and Y.M. Cheong	
Experimental Methods for Three-Dimensional Mixed Mode Fracture	923
H.R. Dong, Q.L. Liu, Z.G. Zhang and Y.X. Cheng	
An Evaluation of Fracture Toughness of Glass-Filled Ceramic Using Notched Specimen	927
J.H. Kim, D.H. Kim, N.S. Rho, Y.S. Lee, S.H. Koo and S.I. Moon	
Weibull Statistics as a Basis for Assessment of Ductile-Brittle Transition Behavior	931
Y.S. Chang, T.R. Lee, J.B. Choi, Y.J. Kim, M.C. Kim and B.S. Lee	
Quantification of Crack Length and Thickness Effects on J-R Curves by Ductile Damage Models	935
Y.S. Chang, T.R. Lee, J.B. Choi, C.S. Seok and Y.J. Kim	

Constraint of Semi-Elliptical Surface Cracks in T and L-Joints	939
H.Y. Lee and Y.J. Kim	
Finite Element Alternating Method for Solving Two-Dimensional Cracks Embedded in a Bimaterial Body	
S.Y. Park and J.H. Park	945
Estimation of the Fatigue Lifetime of Metal Rubber Isolator with Dry Friction Damping	
H.R. Ao, H.Y. Jiang and A.M. Ulanov	949
Life Prediction of Thermo-Mechanical Fatigue for Nickel Based Superalloy IN738LC	
J.S. Hyun, G.W. Song and Y.S. Lee	953
Optimization on the Spot Welded Configuration of Vehicle Components Considering the Structural Performance	
J.S. Eom, B.H. Ju, N. Choi, J.M. Park, B.C. Lee and H.B. Byun	957
Effect of Shot Peening on the Improvement of Durability of Bevel Gear	
S.K. Cheong, D.S. Lee, Y.S. Kang, T.K. Lee and H.K. Kim	963
Crack Orientation Dependence of Fatigue Behavior in Titanium Single Crystals by Thin Sheet Plain Bending	
S. Ando, T. Sakamoto, Y. Ikejiri, M. Tsushida and H. Tonda	967
On Fatigue Crack Propagation of One-Way Rail Road	
K. Farhangdoost and M. Kavoosi	971
Fatigue Fracture Behavior of Mg-Zn-Y Alloy	
S. Ando, K. Toda, M. Tsushida, H. Tonda and Y. Kawamura	975
Fatigue Life Evaluation for Nuclear Power Plant Using Green's Function and Real Operating Histories	
J.C. Kim, M.Y. Ahn, Y.S. Chang, J.B. Choi, Y.J. Kim, M.J. Jhung and Y.H. Choi	979
A Study on the Lower Flanges Fracture of Endplate Bolted Connection	
H.W. Ma, C.D. Cho, Q. Pan and H.G. Beom	983
Random Fatigue Analysis of Automotive Bevel Gear	
D.H. Kim, J.H. Kim, G.G. Kim and Y.S. Lee	987
Examination of the Optimal Local Model Size in the Three-Dimensional Local Hybrid Method	
K. Machida, T. Ueno and H. Oyama	991
A Comparative Study on the Fatigue Evaluation for Weldments under Out-of Plane Bending Load Using Structural Stress and Hot Spot Stress	
M.H. Kim, C.I. Ha, S.W. Kang, J.H. Kim and J.M. Lee	995
Nondestructive Detection of Delamination of Thermally Sprayed Material Using ESPI	
Y. Shinhara, T. Tokuda, F. Suzumura, K. Ohtani, R.G. Wang and M. Kido	999
Dynamic Fracture of Mode I Crack in Orthotropic Composites Studied by Caustics Method	
K.Z. Gong, W.Z. Qin, Z. Li and B. Fu	1003
Evaluation of Corrosion Fatigue Crack Initiation Life of 13Cr Steel	
W.B. Kim, J.K. Paik and H. Yajima	1007
Evaluation of Low-Cycle Fatigue in Simulated PWR Environment	
I.S. Jeong, S.J. Kim, T.H. Song and S.Y. Hong	1011
Evaluation and Test of the Creep-Fatigue Defect Growth in a Cylindrical Structure in a Liquid Metal Reactor	
C.G. Park, J.B. Kim and J.H. Lee	1015
Experimental Simulation of Complex Thermo-Mechanical Fatigue	
R. Bardenheier and G. Rogers	1019
Accelerated Fatigue Tests of BS 080A42 Steel Using the WBE Mission Loadings	
S. Abdullah and A.K. Ariffin	1023
Fatigue Life Simulation of a High Pressure Breech System	
S.K. Koh, E.G. Na, T.H. Baek, K.J. Kang, S.T. Ahn and T.H. Han	1027
Effects of Stress Frequency and Stress Ratio on the Fatigue of Glass/Epoxy Composite Materials	
S.F. Hwang and Y.D. Su	1031
An Evaluation of Low-Cycle Fatigue Property for Sn-3.5Ag and Sn-0.7Cu Lead-Free Solders Using Surface Deformation	
T. Takahashi, S. Hioki, I. Shohji and O. Kamiya	1035

Tensile Behavior and Fracture Toughness of Glass Fiber Reinforced Aluminum Laminates According to Fiber Layer Orientation	1039
S.C. Woo	
Failure Analysis and Strength Evaluation in Brazed Joints	1043
K.W. Kang, H.J. Shim, C.M. Kim and J.K. Kim	
Damage Mechanism of Wheel for High Speed Train Based on Fracture Mechanics	1047
S.J. Kwon, J.W. Seo, D.H. Lee and C.W. Lee	
A Study on the Relationship between Fatigue Crack Growth Behavior and Cyclic Crack Tip Opening Displacement	1051
H.C. Choi and H.K. Choi	
The Static Collapse Characteristics of CFRP Side Members Due to Stacking Condition	1055
K.S. Lee and I.Y. Yang	
An Experimental Study on the Corrosion and Fatigue of Structural Steels	1059
B.C. Goo	
An Experimental Study on the Pre-Strain Effect of API 5L X65 Pipeline for Natural Gas Transmission	1063
J.H. Baek, Y.P. Kim, W.S. Kim and C.S. Seok	
Effects of Residual Stress and Traction Force on the Contact Fatigue Life of Railway Wheels	1067
J.W. Seo, H.M. Hur, S.T. Kwon, J.B. Choi and Y.J. Kim	
Observations of Fatigue Damage in the Press-Fitted Shaft under Bending Loads	1071
D.H. Lee, S.J. Kwon, J.B. Choi and Y.J. Kim	
Characteristics of Wheel Tread for Property Improvement of Railway Wheel	1075
S.J. Kwon, J.W. Seo, H.M. Hur and S.T. Kwon	
3-Dimensional Finite Element Analysis of the Residual Stress by Cold Expansion Method and Interference Fit	1079
J.S. Jang, M.R. Cho and W.H. Yang	
Fatigue Design of Leaf Spring Using Artificial Neural Network	1083
W.S. Jung, D.H. Bae, G.W. Song, J.S. Hyun and B.S. Kim	
A Study on the Structural Analysis and Loading Test of the Bogie Frame	1087
S.C. Yoon, W.K. Kim and J.G. Kim	
A Study on the Fatigue Characteristics of Al6061-T651 by Shot Peening Velocity	1093
W.J. Park, S. Huh and S.H. Park	

VII. Material Testing

An Experimental Study of Automotive Bushing for Radial Mode	1097
J.Y. Jeong, J.S. Park, S.J. Kim, S.Y. Lee, W.H. Lee, C.S. Park, J.P. Hong and S.B. Lee	
The Improved Johnson-Cook's Strength Model Taking Account of the Rate-Dependent Micro-Damage Evolution for C30 Concrete	1101
S.C. Shih, Y.Z. Wang and L.L. Wang	
Creep Properties of Hastelloy-X Alloy for the High Temperature Gas-Cooled Reactor	1105
W.G. Kim, S.N. Yin, W.S. Ryu and J.H. Chang	
Effect of Initial Static Load on the Rate-Sensitive Behavior of Concrete in Compression	1109
D.M. Yan and G. Lin	
Experimental Verification of the Structural Damage Identification Method Developed for Beam Structures	1113
D. Youn, U. Lee and O.Y. Kwon	
Damage Evolution Inspection of Rock Using Digital Speckle Correlation Method (DSCM)	1117
S.P. Ma, L.G. Wang and G.C. Jin	
Contact Damage Analysis of Hot Mill Spindle Assembly with Kinematics Simulation	1121
S.W. Byun, Y.S. Lee, H.S. Lee and J.J. Lee	
Mechanical Analysis of Buckling Failure of Bedding Rock Slopes	1125
C.H. Liu, Z.H. Ye, C.X. Chen, X.T. Feng, Q. Shen and G.F. Xiao	
Creep Characteristics and Micro-Defects of Main Steam Pipe Steel at High Temperature	1129
C.S. Jeong, B.J. Kim and B.S. Lim	
Stability Limits of Premixed Methane-Air Microflames for Micropower Generation	1133
O.C. Kwon, K.H. Lee, H.S. Ko and T. Kim	

Effect of the Frequency of the Cyclic Load to the Inverse Analyses of the Heat Conduction in Infrared Thermography K. Machida and S. Miyagawa	1137
The Thermal Cyclic Behavior of the VPS and HVOF-Sprayed MCrAlY Coatings J.S. Jung, K.B. Yoo, E.H. Kim, C.H. Jeon and D.H. Kim	1141
Experimental and Numerical Study on Enhanced Heat Transfer of Solid-Liquid PCM by Ultrasonic Wave H.D. Yang and Y.K. Oh	1145
Experimental and Theoretical Study of Frequency and Temperature Dependence on Seismic Attenuation of Saturated Rocks X.Y. Liu, C.Y. Zhang, D.Y. Xi and Q.S. Liu	1149
Modeling of Filtration for a Metal Foam Diesel Particulate Filter J.M. Lee, N.W. Sung, G.B. Cho and K.O. Oh	1153
The Effect of Temperature and Sizes on Deformation of Cantilever Rectangular Plate with Double Layer M.J. Lin and Y.J. Chou	1157
Experimental Study on the Film Cooling Performance at the Leading Edge of Turbine Blade Using Infrared Thermography K.S. Kim and Y.J. Kim	1161
Investigation of Local Failure Criteria of Wall-Thinned Area by Simulated Specimen Tests D.H. Kim, J.W. Kim, Y.S. Na and C.Y. Park	1165
Fatigue Damage Analysis of Drill Pipes Using FEM and Cox Regression Model K. Farhangdoost and M. Siahpoosh	1169
Evaluation of Thermal Fatigue Properties of Surface Treated AISI H13 Steel for Aluminum Die-Casting K.T. Youn, Y.M. Rhyim, W.J. Yang, J.H. Lee and C.G. Lee	1173
Microstructure and Damage Evolution of Ceramic Matrix Composite W.G. Pan, G.Q. Jiao and B. Wang	1177
Effect of Surface Treatment on the Life of AISI H13 Steel Core Pin for Die-Casting Y.M. Rhyim, K.T. Youn, Y.S. Na and J.H. Lee	1181
Experimental Investigation on Friction and Wear of Coated Vane under the Environments of Lubricants and CO₂ as a Refrigerant S.D. Oh, K.S. Lee, J.S. Kim, S.O. Cho and Y.Z. Lee	1185
Influence of Stick-Slip Behavior on Friction and Wear under Fretting Conditions S.H. Jeong, S.J. Yong, T.S. Ahn and Y.Z. Lee	1189
The Geometry Characteristics of Rock Mass of Multi-Fields Coupling Action G. Zhang, G.H. Tang, J.X. Chen and A.F. Zhou	1193
The Structural Stability Analysis of an Articulation Type Container Crane Using Wind Tunnel Test S.W. Lee, D.S. Han and G.J. Han	1197
Effect of Isothermal Aging on Magnetic Properties in 12Cr Steel C.S. Kim, I.H. Kim, I.K. Park and C.Y. Hyun	1201
FDM/FEM Hybrid Method with a Systematic Field Data Conversion Procedure for Thermal Stress Analysis in Casting Process B.H. Choi, W.J. Kim, C.D. Cho, S.Y. Kwak and C.K. Choi	1205
An Improved Hybrid Full-Field Stress Analysis of Circularly Perforated Plate by Photoelasticity and Finite Element Analysis T.H. Baek, S.K. Koh and T.G. Park	1209
Process Parameter Optimization for Machining SiC_p/Al-MMC Using RSM and GA J.S. Kwak, L.Z. Chi, Y. Koo, Y.D. Jeong and M.K. Ha	1213
Topology Optimization of a Vehicle's Hood Using Evolutionary Structural Optimization S.H. Choi, J.Y. Park, I.S. Shin and S.Y. Han	1217
Physical Modeling and Characteristics of a Johnsen-Rahbek Type Electrostatic Chuck J.S. Choi, J.H. Yoo, S.J. Hong, T.H. Kim and S.J. Lee	1221
Development of a Reconfigurable Mobile Robot and Precise Position Estimation Based on Extended Kalman Filter G.H. Yeo, J. Kim and B.S. Kang	1225

Development of Dynamic Photoelastic Experimental Hybrid Method for Orthotropic Material	1229
J.H. Nam, J.S. Hawong, O.S. Lee and D.C. Shin	
Effects of Superplasticity in Boronizing of Duplex Stainless Steel	1233
R. Hasan, I. Jauhari, H. Ogihara and R.D. Ramdan	
Tensile Damage Characterization in Nicalon Fiber Reinforced Ceramic Composites	1237
J.G. Kim	
The Predictions of the Fretting Wear between Supporting Grids and Cladding Tubes of Nuclear Fuel Rod	1243
Y.C. Park, Y.H. Kim, S.J. Lee and Y.Z. Lee	
Root Cause Analysis of Tube Weld Failure of the Lubrication Oil Cooling Tube in Thrust Bearing of Pump	1247
M.H. Boo and C.Y. Park	
Wear Scar Progression of Impact-Fretting at Elevated Temperature for Steam Generator Tubes in Nuclear Power Plants	1251
C.Y. Park and J.K. Lee	
The Experiment Study on the Shielded Charge Initiated by the High Speed Fragment	1255
J. Huang, Q.M. Zhang, J.Q. Li and C. Xiao	
A Study on Sealing Mechanism of Butterfly Valve	1259
S. Huh, Y.G. Jung, W.J. Park and J.J. Sim	
Wear Transitions of Tube-Support Components for a Nuclear Steam Generator under Fretting Conditions	1263
S.H. Jeong, J.M. Park, J.H. Lee and Y.Z. Lee	
Evaluation of Defect in Composite Using Acousto-Ultrasonic Technique	1267
M.R. Lee and J.H. Lee	
Cure Kinetic Behavior of 191# Unsaturated Polyester Resin Used in Advanced Composites	1271
M. Yang, S.L. Yan and M. Liu	
A Study on the Cooling Characteristics of TMA Clathrate Compound with Additives	1275
C.O. Kim, J.H. Kim and N.K. Chung	
Experiments and Characteristic Analysis of a Sealless Pneumatic Cylinder	1279
D.S. Kim, S.K. Bae and B.O. Choi	
An Electromagnetic and Thermo-Mechanical Analysis of High Frequency Induction Heating for Steel Plate Bending	1283
J.H. Lee, K.H. Lee and J.S. Yun	
Analysis of Residual Stresses in Multi-Pass Welding Using Element Generation Technique	1287
J.H. Lee, K.H. Lee and C.W. Lee	
Research on the Precipitates in Warm-Rolled Ti-Bearing Interstitial-Free Steel Sheets	1291
C.N. Jing, Z.C. Wang, F.T. Han, W.P. Zhang and Y.H. Yi	
Local Heat Transfer Measurements Using Liquid Crystal Thermography Technique	1295
D.H. Lee, C.Y. Lim, M.H. Jeon, M.K. Kim, S.B. Park and K.S. Lee	
A Study of Judder Vibration in Automotive Disk Brakes	1301
H.J. Cho, C.D. Cho, M.G. Kim, J.W. Maeng and S.K. Lee	
Local Heat Transfer Measurements and Numerical Analysis in the Cooling Passage of the Ventilated Disc Brake with Semi-Cylindrically Grooved Surface	1305
D.H. Lee, C.Y. Lim, K.I. Yoon, M.S. Kim, M.K. Kim, S.B. Park and K.S. Lee	
On Creep Rupture Characteristics in STS304 Stainless Steels	1309
S.J. Kim, Y.S. Kong, Y.J. Noh, W.T. Jung and S.W. Kwon	
Creep-Life Prediction of Type 316LN Stainless Steel by Minimum Commitment Method	1313
W.G. Kim, S.N. Yin, W.S. Ryu and W. Yi	
Application of Photocatalytic Metal Membrane System for Water Purification	1317
J.O. Kim, J.T. Jung and W.Y. Choi	
A Study on Flow Performance of Axial Inlet Cyclone for Dust Collector	1321
I.K. Kim and J.S. Kim	
Experimental Performance Verifications for Compound CVT with Differential Gear	1325
Y.S. Kim and J.M. Park	
A Study on the Cracked Specimen for Biaxial Tensile Loading Test	1331
D.C. Shin, B.G. Nam, J.H. Nam, J.S. Hawong and K. Watanabe	

A Study on the Development of Reflective Photoelastic Experimental Hybrid Method on the Static Plane Problems of Isotropic Material

J.S. Hawong and D.C. Shin 1335

ASME Code Evaluation on Stress Analysis of Snubber

S. Huh, H.S. Chung, H.M. Jeong and B.K. Choi 1339

VIII. Smart Materials**Flexible Force Sensors Using Fiber Bragg Grating**

J.S. Heo, J.H. Cheung and J.J. Lee 1343

Self-Oscillating Microcantilever Piezoresistive Flow Sensor

J.S. Go, B.S. Shin and J.S. Ko 1347

The Application of Fiber Optic Sensor to the Study of Engineering Structure

Q.R. Zhu, R.H. Fang, G.B. Yang and W.M. Zeng 1351

Modulating the Optical Fiber Sensor of Laser Doppler Anemometry for Measuring the Chicken Blood Velocity

Y.C. Chen, Z.C. Chen, T.W. Lu and C.M. Chen 1355

A Novel Microcantilever Device with Nano-Interdigitated Electrodes (Nano-IDEs) for Biosensing Applications

J.A. Lee, J.Y. Yun, S.S. Lee and K.C. Lee 1359

Electronic Transport Properties of Chemical Gas Sensor Using Conducting Polymer PAni

J.J. Lee, S.Y. Park, S.W. Lee and I.D. Jeon 1363

MEMS-Based Fabrication of Multi-Walled Carbon Nanotube pH Sensor

K.S. Lee, J.H. Kwon, S.I. Moon, W.S. Cho, Y.H. Lee and B.K. Ju 1367

An Electrical Signal Detection System for a Microbiochip with Gold Nanoparticles

J.J. Park, D.J. Kim, B.W. Ahn, S.H. Lee, Y.M. Ahn, S.Y. Hwang and N.G. Cho 1371

Robust Electro-Active Paper Actuator in Room Humidity

J.H. Kim, N.G. Wang, Y. Chen, S.K. Lee and C.H. Yang 1375

A MEMS Position Encoder for Comb-Drive Actuators Using Suspended Gate Field-Effect Transistors

T.W. Lin, M.T.K. Hou and R.S. Chen 1379

Large Displacement Out-Of-Plane Bimorph Actuator for Optical Application

W.K. Jeung, Y.J. Kim and S.M. Choi 1383

Soft Linear Actuator Based on Dielectric Elastomer

H.R. Choi, M.Y. Jung, N.H. Chuc, J.W. Kim, I.M. Koo, K.M. Jung, Y.K. Lee, J.D. Nam and J.C. Koo 1387

A DoD Injector Applicable to High-Viscosity Materials in High-Temperature

T.M. Lee, T.G. Kang, J.S. Yang, D.S. Kim, J.D. Jo, B.O. Choi and K.Y. Kim 1391

A Development of Miniaturized Piezoelectric Actuator System for Mobile Smart Structures

I.P. Kang, H.B. Chae, K.H. Park, K.J. Yoon, L.L. Xin and T.S. Kang 1395

Position Controller for Piezoelectric Actuator

S.N. Yun, Y.B. Ham, J.H. Park and B.O. Choi 1399

Behavior of Lightweight Piezoceramic Composite Actuator under Compressive Load

Q.V. Nguyen, N.S. Goo and H.C. Park 1403

Structural Design of Piezoelectric Actuator Considering Polarization Direction and Continuous Approximation of Material Distribution

Y.S. Lim, S.J. Min and S. Nishiwaki 1407

A Study on the Actuating Performance of Unimorph Piezoelectric Actuators with a Center Load

N.T. Nguyen and K.J. Yoon 1411

Wireless Strain Monitoring of CFRP Laminates Using Electric Resistance Change with Oscillating Circuit

R. Matsuzaki and A. Todoroki 1415

Experimental Investigation of Smart Hull Structures Based on Macro Fiber Composite Actuators

J.W. Sohn, H.S. Kim, S.B. Choi and K.S. Kim 1419

Noise Effect on Estimation Accuracy of Delamination Monitoring Methods for CFRP Laminate Using Electric Property Change

M. Ueda and A. Todoroki 1423

Performance Evaluation of the Embedded System for Automated Manual Transmissions Using Test Rig	1427
K.W. Han, W.S. Ryu, J.W. Jeon, H.K. Choi, H.S. Kim and S.H. Hwang	
Development and Evaluation of a Contacting Force Measurement System in a High Temperature and Pressure Water Condition for Fretting Wear Experiments	1431
Y.H. Lee and H.K. Kim	
A Piezoelectrically Actuated Biomimetic Walking Robot	1435
A.A. Yumaryanto, J.B. An and L.L. Xin	
Identification of a Fish-Like Robot Using Inertial Sensors	1439
I. Ariyanto, T.S. Kang and Y.J. Lee	
Mechanical Design of Biomimetic Fish Robot Using LIPCA as Artificial Muscle	1443
T. Wiguna, S. Heo, H.C. Park and N.S. Goo	
A Carbon Nanotube Film for Power Harvesting	1447
I.P. Kang, G.R. Choi, J.Y. Jung, Y.H. Chang, Y.S. Choi and M.J. Schulz	
Sensor Characteristics of Carbon Fiber Mat	1451
X.Y. Zhang, Z.Q. Li, X.H. Song and Y. Lv	
A Study on the Materials Properties of Piezoelectric Ceramics Used in Jetting Apparatus	1455
J.W. Yang, C.S. Park, W.C. Sim, Y.J. Kim, S.Y. Kim, C.M. Yang, S.J. Park, Y.S. Yoo and J.W. Joung	
Hysteretic Behaviors of Yield Stress in Smart ER/MR Materials: Experimental Results	1459
Y.M. Han, Q.H. Nguyen, S.B. Choi and K.S. Kim	
Estimation Local Strength of Bow Structure for High Tensile Steel Yacht Based on Optimum Design	1463
J.S. Park, Y.Y. Kim and T. Yao	
An Analysis of Temperature Stress and Deforming Considering Shrinkage and Creep in Super-Long Frame Structure	1467
Y.Y. Li and Y.S. Zhang	
Optimum Design for Bow Structure of High Tensile Steel Yacht	1471
Y.Y. Kim, S.C. Shin and J.Y. Ko	
One-Dimensional Shape Memory Alloy Model Applicable to Any Status of Stress and Temperature	1475
J.H. Chung, J.S. Heo, M.S. Won, W.Y. Lee and J.J. Lee	
Fabrication of Single Walled-Carbon Nanotubes Based pH Sensor Using Ultra-Precision Spray	1479
J.H. Kwon, K.S. Lee and B.K. Ju	
Development of a Bi-Axial Acceleration-Detecting Device for a Tube	1483
D.S. Oh, Y.H. Lee, C.H. Shin, T.H. Chun, H.K. Kim and K.B. Lee	
A Micro Fluxgate Magnetic Sensor Using New Printed Circuit Board Technology	1487
W.Y. Choi, J.S. Hwang and S.O. Choi	
Rectangular Microlens Array Having High Sag for Multi Chip LED Packaging	1491
W.K. Jeung, C.H. Lim, T.H. Kim and S.M. Choi	
Oscillation Loop for a Resonant Type MEMS Accelerometer and Its Performance under Noisy Condition	1495
C. Hyun, J.G. Lee and T.S. Kang	
Research of Self-Monitoring Mechanism of Electrically Conductive Asphalt-Based Composite	1499
S.P. Wu, X.M. Liu, L.T. Mo and Q.S. Ye	
Temperature Compensation in Deformation Testing for Smart Concrete Structures	1503
X.H. Song, L.X. Zheng and Z.Q. Li	
Piezoelectric Effect of Electro-Active Paper Materials	1507
H.S. Kim, J.H. Kim, L.J. Zhao, S.D. Jang, K.Y. Yun and S.K. Lee	
The Characteristic Analysis of a Piezoelectric Actuator for Valveless Micropumps	1511
S.H. Lee, S. Heo, C.W. Kim and K.J. Yoon	
Preparation of Polydivinylbenzene/Au Core-Shell Beads	1515
K.X. Phan, M.S. Cho, J.D. Nam, H.R. Choi, J.C. Koo and Y.K. Lee	
Transparent and Conductive PEDOT Films on PET Substrate Using an Epoxy Acrylate Binder	1519
S.Y. Kim, M.S. Cho, J.D. Nam, H.R. Choi, J.C. Koo and Y.K. Lee	

Modal Reduced Order Model for Vision Sensing of IPMC Actuator

I.K. Oh, S.W. Yeom and D.W. Lee

1523

IX. Impact Session**Impact Strength Assessment of LNG Carrier Insulation System**

J.M. Lee and M.H. Kim

1527

Analysis of Pile-Soil Interaction by Computer Simulation

G. Zhang, D.Z. Pan, J.X. Chen and A.F. Zhou

1531

Impact Modeling of Sawing Tasks and Experimental Verification Using a Parallel Robot

B.R. So, J.H. Lee, B.J. Yi, S.Y. Han and S.J. Kim

1535

Numerical Simulation of SHPB Experiment on Dynamic Behaviour of Ceramic Particle Reinforced MMCs

L.S. Liu, D.F. Cao, J.T. Zhang and Q.J. Zhang

1539

Experimental Study on the Dynamic Splitting Tensile Behaviour of Concrete

L.J. Zhang, X.P. Yan, Z.H. Wang and H.W. Ma

1543

On Computer Aided Impact Experiments - A Case of Drop Weight Experiment -

Y. Sato and K. Nishimura

1547

New Technique for "Cullet" Generation of Glass Bottles by Using Underwater Shockwave

H. Sakamoto, S. Kawabe, K. Satoh, M. Himeno and S. Itoh

1551

Impact Analysis and Test of the Spacer Grid Assembly for PWRs

K.N. Song, K.H. Yoon, J.J. Lee and K.J. Park

1555

Elastic Transverse Impact on Beams

D. Goldar

1559

Fibre-Reinforced Polymers under Impact Load

C.R. Koenig, D.H. Mueller, J. Mueller and M. Calomfirescu

1563

Characterization of Impact Fracture Behavior of Biodegradable PLA/PCL Polymer Blend

T. Takayama, M. Todo and K. Arakawa

1569

Dynamic Response and Fracture of High Strength Boride/Alumina Ceramic Composite

D.F. Cao, L.S. Liu and J.T. Zhang

1573

Dynamic Deformation Behavior of Soft Materials at the Low Temperature Using SHPB Technique and Pulse Shaper

O.S. Lee, S.H. Kim and Y.H. Han

1577

Experimental Study on Dynamic Compression of Nylon Reinforced Concrete

Q.M. Zhang, Z.M. Gu, L. Chen, X.Y. Wang and S.S. Hu

1581

Experimental and Numerical Analyses of a Head Arm Assembly of a Micro-Drive

B.J. Shi, D.W. Shu, J. Luo, Q.Y. Ng and J.H.T. Lau

1585

Driving Sound Noise Characteristics Emitted by Various Optical Disk Drives

S.W. Oh and D.H. Kim

1589

Nonsymmetric Groove Pattern Design for Precise Micro-Spindles

D.H. Oh, N.H. Lee, J.C. Koo, H.K. Choi and Y.S. Choi

1595

Investigation of the Impact Analysis of Microscale Thin-Walled Structures Manufactured by High-Speed Machining

B.S. Shin

1599

An Estimation of the Dynamic Buckling Load for the Spacer Grid of Pressurized Water Reactor Fuel Assembly

S.Y. Jeon and Y.S. Lee

1603

Analysis of Dual Mass Flywheel Using Discrete Arcspring Model

T.H. Kim, H.L. Song, S.H. Hwang and H.S. Kim

1607

On Stability and Support Measures of Rock Mass Surrounding the Diphead of a Coal Mine

Q.S. Liu, Y.H. Hu and Y.Y. Jiao

1611

A Study on the Vibrational Characteristics of the Continuous Circular Cylindrical Shell with the Multiple Supports Using the Experimental Modal Analysis

Y.S. Lee, H.S. Kim and C.H. Han

1617

Experimental Studies on the Impact Buckling of Bars and the Effect of Stress Wave

R. Wang, Z.J. Han and S.Y. Zhang

1621

Experimental Determination of Non-Ideal Structural Boundary Conditions Based on Spectral Element Model	1625
J.Y. Cho and U. Lee	
Spectral FEM-Based Dynamic Characterization of Structural Joints: Theory and Experiment	1629
U. Lee, J.Y. Cho and C.D. Cho	
Experimental Study of Reinforced Concrete Subjected to Shock Loading	1633
J.G. Ning and F. Jiang	
Study on the Circular Fracture in MFCG Armatures Expansion	1637
X. Chen and Q.J. Jiao	
Nonplanar Nonlinear Vibration Phenomenon on the One to One Internal Resonance of the Circular Cantilever Beam	1641
M.G. Kim, C.D. Cho, C.B. Kim and H.J. Cho	
Study on Formative Mechanism of Blasting Crater in Reinforced Concrete under Internal Blast Loading	1645
Y.S. Fu, Q.M. Zhang and H.J. Wang	
A Study on the Relationship between Clamping Angle of a Locker and Initial Clamping Force in the Wedge Type Rail Clamp for a Container Crane	1649
G.J. Han, S.W. Lee and D.S. Han	
Dynamic Compressive Strength of Aluminum Alloy Foams	1653
Z.H. Wang, H.W. Ma, L.M. Zhao and G.T. Yang	
Experimental Study on the Fluctuating Pressure Acting on a 5x5 Partial Fuel Assembly in a Parallel Flow	1657
K.H. Lee, H.S. Kang, K.H. Yoon and K.N. Song	
Strain-Rate Sensitivity of Concrete: Influence of Moisture Content	1661
G. Lin and D.M. Yan	
Analysis of Impact Fracture Behavior in Bulk Amorphous Metals Using Instrumented Impact Testing Apparatus	1665
H.S. Shin and K.H. Kim	
Impact Energy Measurement of a Hydraulic Breaker	1669
J.W. Park and H.E. Kim	

X. Composite Materials

Effect of Al₁₈B₄O₃₃ Whisker Surface Treatment on Aging Behavior of Al₁₈B₄O₃₃ Whisker/ZK60 Magnesium Alloy Composites	1673
W.G. Wang, Y. Hasegawa, Y.B. Choi, N. Fuyama, K. Matsugi, O. Yanagisawa and G. Sasaki	
A Study on Properties and Kinetics of Carburizing Superplastic Duplex Stainless Steel	1677
N.R.N. Masdek, I. Jauhari, R.D. Ramdan and R. Hasan	
FEA-Based Design and Fabrication of Functionally Graded Materials	1681
K.H. Shin and S.K. Cheong	
Experimental Investigation on 2D and 3D Braided C/SiC Composites	1685
B. Wang, G.Q. Jiao, Y.J. Chang and W.G. Pan	
Effect of Air-Coupled/Conventional Ultrasound Waves on Resin-Infiltrated Time of Wood Natural Materials	1689
I.Y. Yang, S.K. Kim, K.S. Lee, D.K. Hsu, J.W. Park and K.H. Im	
Detection of Impact Damage in Composite Plates Using Surface Contact Method	1693
H.J. Chun, D.W. Kim and J.H. Byun	
Damage Identification by Embedded Piezoceramic Sensors in the Composite Plate	1697
H.J. Chun, C.H. Yi and J.H. Byun	
Bending Characteristics of Plate-Type Piezoelectric Composite Actuators According to Applied Electric Fields and Drive Frequencies	1701
S.C. Woo and N.S. Goo	
Development of FRP-Concrete Composite Bridge Deck in Korea - State-of-the-Art Review -	1705
J.H. Nam, S.J. Yoon, H.D. Moon, D.M. Ok and S.J. Hong	
Experimental Studies on Mechanical Properties of Rock Joints under Dynamic Loading	1709
H.B. Li, H.P. Feng, B. Liu and J.R. Li	
Measuring Elastic Properties of Circular Tube Made with Thermoplastic Composites	1713
D.J. Lee	

Seismic Performance of Bridge Pier with FRP Wrapping H.J. Joo, S.S. Lee, S.J. Yoon, J.K. Park and S.K. Cho	1717
Analysis of Mechanical Effects of Plant's Roots on Slope Reinforcement J.X. Chen, S.S. Hu and G. Zhang	1721
Microwave Curing and Its Application to Aircraft Structure Repair J.H. Zhang and Y.C. Dai	1725
Evaluation of Dimple Treatment for GFRP/Metal Co-Cured Joint R. Matsuzaki, M. Shibata and A. Todoroki	1729
Buckling of Composite Thin-Walled Members S.S. Lee, S.J. Yoon and S.Y. Back	1733
Preparation of Electrospun Protein Nanofibers with Multiwalled Carbon Nanotubes M.S. Kang, S.H. Yoon and H.J. Jin	1737
Low Pressure Casting Process of FeCrSi/A366.0 Alloy Composites and Their Characterization Y.B. Choi, S. Gen, M. Kazuhiro, K. Shunsaku and Y. Osamu	1741
Compression Method for Superplastic Boronizing of DSS R. Hasan, I. Jauhari, H. Ogiyama and R.D. Ramdan	1745
Preparation and Characterization of Polyimide/BaTiO₃ Nanocomposite Films with Lower Infrared Emissivity B.P. Lin, H.J. Liu, Y.M. Sun and C.W. Yuan	1749
Tensile and Shear Properties of Stitched Laminates in Hygrothermal Environment T. Huang, G.Q. Jiao and T.T. Xu	1753
Characteristic Fracture Assessment of a Rivet Joint for Hybrid Composite Laminates under Static and Fatigue Shear Loads D.W. Jung and N.S. Choi	1757
Impact Characteristics of a Honeycomb Sandwich Panel J.H. Lee, S.K. Cheong and K.H. Shin	1761
Dynamic Instability of Delaminated Composite Plates under Parametric Excitation M.K. Yeh and K.C. Tung	1765
An Experimental Study of Dropped Ply Region in Composite C.W. Zhao and Y.M. Xing	1769
Experimental and Finite Element Characterization of the Crippling Failure of Composite Stiffeners J.H. Kweon, S.M. Choi, H.J. Son, J.Y. Choi, J.H. Choi and W.S. Che	1773
Strength of Composite Laminated Bolted Joint Subjected to a Clamping Force J.H. Choi, Y.H. Lee, J.H. Kweon and W.S. Che	1777
Development of New-Type Similar Materials of Geomechanics Models Test for Geotechnical Engineering Q.Y. Zhang, W.S. Zhu, Y. Li and X.H. Guo	1781
Preparation of Biodegradable Nanocomposites by Incorporation of Functionalized Carbon Nanotubes H.S. Kim, B.H. Park, J.S. Yoon and H.J. Jin	1785
Inspecting Carbon Matrix Composites with Airborne/Conventional Ultrasound J.K. Sim, K.H. Im, D.K. Hsu, S.J. Song, H. Cho, H.J. Kim, Y.H. Seo and I.Y. Yang	1789
Impact Damage Behavior of Glass/Epoxy Laminates for Railway Vehicle at Low Temperature K.W. Kang, S.Y. Yang, J.H. Kim, J.K. Kim, H.S. Kim and H.J. Kim	1793
Experimental Study on Mechanical Property of Thermo-Mechanical and Hydro-Mechanical Coupling Condition for a Sandstone Q.C. Zhou, H.B. Li, C.H. Yang and C.W. Luo	1797
New Type Geo-Mechanical Similar Material Experiments Research and Its Application S.C. Li, H.P. Wang, Q.Y. Zhang and Y. Li	1801
Force Transfer Mechanism in Embedded Steel Column Bases Y.H. Kim, S.S. Lee, J.H. Jung and S.J. Yoon	1805
Evaluation of Load Carrying Capacity of the Perforated Shear Connector with Flange Heads Y.H. Kim, J.H. Jung, S.J. Yoon and W.S. Jang	1811

Effect of Fiber Aspect Ratio and Area Ratio Getting to Accuracy of Intensity Method in Fiber Orientation Angle Distribution Measurement	1817
J.W. Kim and D.G. Lee	
Seismic Performance of In-Filled Steel-Concrete Composite Columns Using Fiber Analysis Method	1821
J.H. Kim and T.W. Kim	
Bending Collapse Behaviors and Energy Absorption Characteristics of Aluminum-GFRP Hybrid Tube Beams	1825
S.H. Lee, C.W. Kim and N.S. Choi	
Characterization of Polycarbonate/Multiwalled Carbon Nanotube Composites	1829
H.S. Kim, B.H. Park, M.S. Kang, J.S. Yoon and H.J. Jin	
Damage Development in CFRP Laminates under Impact Loading	1833
S.M. Jang, T. Adachi and A. Yamaji	
A Study on the Structural Stress Analysis of the Steel and the GFRP Laminated Composite Cylindrical Shell with a Stiffened Circular Cutout	1837
Y.S. Lee, J.J. Lee, Y.K. Kang and S.Y. Song	
Experimental Research on Failure Mechanism of a CVI-Fabricated Ceramic Matrix Composite under Compression	1841
G.Y. Guan, G.Q. Jiao and T. Huang	
Wear Behavior of SiC_p Reinforced Metal Matrix Composites Fabricated by Thermal Spray Process	1845
Y.S. Kim and K.T. Kim	
Protuberant Morphology of Electrospun Polymeric Fibers	1849
M.S. Kang, W.I. Park, R. Jung and H.J. Jin	
Characterization of Liquid Phase Sintered SiC Ceramics with Oxide Additive Materials	1853
S.L. Lee, Y.S. Shin, J.K. Lee, J.H. Lee and J.Y. Park	
Microstructure and Mechanical Properties of Al₂O₃-TiC/Al In Situ Composites	1857
H.M. Chen, H.S. Yu, J. Zhang, L. Zhang and G.H. Min	
Development of Accelerated Life Test Method of Hydraulic Pump	1861
D.S. Jung, H.E. Kim, S.H. Kim and E.S. Kang	
Accelerated Life Testing Method of Transmission	1865
H.E. Kim, D.S. Kim, Y.P. Lee and Y.C. Yoo	

Authors Index

Keyword Index