

# **Advanced Engineering and Materials**

**Selected, peer reviewed papers from the 2013 International Conference on  
Mechanical Engineering and Materials (ICMEM 2013)**

**Applied Mechanics and Materials Volume 302**

**Sanya, China  
27 – 28 January 2013**

Editors:

**Wen Jin**

**ISBN: 978-1-62748-059-8  
ISSN: 1660-9336**

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



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

Copyright© (2013) by Trans Tech Publications Ltd.  
All rights reserved.

Printed by Curran Associates, Inc. (2013)

For permission requests, please contact Trans Tech Publications Ltd.  
at the address below.

Trans Tech Publications Ltd.  
Laubisrutisr 24  
CH-8712 Stafa-Zuerich  
Switzerland

Fax: +41 (44) 922 10 33 Fax: +1 (603) 632-5611  
e-mail: sales@ttp.net

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: curran@proceedings.com  
Web: www.proceedings.com

# Table of Contents

## Preface and Organizing Committees

## Chapter 1: Advanced Material Science and Engineering, Material Processing and Manufacturing Technology

<b>Application of Pico-Second Laser on Low-K Wafer Dicing</b> S.J. Wu and W.V. Chao	3
<b>PZT Thin Films Deposited by RF Magnetron Sputtering</b> S.F. Hwang and W.B. Li	8
<b>Study on Impact Protection Properties of Titanium Alloy Using Modified SHPB</b> J. Liu, J.X. Liu, H.S. Ding, S.K. Li and Y.M. Luo	14
<b>Mathematical Simulation of Membrane-Absorption for H<sub>2</sub>S Capture from Nature Gas</b> L. Ma, S.L. Wang, J. Wang, E.T. Li and X. Cao	20
<b>Histomorphometric Analysis: Effects of Simvastatin on Bone Mass, Microarchitecture and Turnover in Normal Rat</b> F.M. Tian, L. Zhang, H. Zhang, J. Zheng, D.C. Han and F. Yang	26
<b>Fabrication of TiO<sub>2</sub> Nanotube Arrays in Ethylene Glycol Electrolyte by the Electrochemical Anodization Method</b> R. Liu, L.S. Qiang, W.D. Yang and H.Y. Liu	31
<b>Investigations of Oxy-Fuel Combustion Characteristics and Oxygen Permeation Process in a Stagnation Flow ITM Reactor</b> M. Nemitallah, M.A. Habib and R. Ben-Mansour	35
<b>Fluid to Fluid Modeling for Post Dry Out Using Dimensional Analysis and Energy Scaling</b> M. Nemitallah and M. El-Nakla	42
<b>The Effect of Radiation on Oxy-Fuel Combustion Characteristics in Microchannels</b> R. Ben-Mansour, M.A. Habib and P. Ahmed	49
<b>Analytical Evaluation of Al 6082-T6 Weld Zone Using Randomised Mixing Material Model</b> D.Y. Kim, W.J. Kang, H.M. Cho and S.S. Cheon	55
<b>Additional Aging Effect after Carbonation Process of Fly Ash Based Eco-Materials</b> Y.T. Kim and J.Y. Park	61
<b>Effect of Pulsed Electron Beam Treatment and Hydrogen on Properties of Zirconium Alloy</b> N.S. Pushilina, E.N. Stepanova, E.V. Berezneeva, A.M. Lider, I.P. Chernov and S.V. Ivanova	66
<b>Design Optimization of Composite-Insulated Telescopic Aerial Boom</b> D.P. Hong, B.K. Lee, C.G. Park, S.H. Wang, S.J. You and Y. Hong	72
<b>Effect of Minor V Addition on Al<sub>88</sub>Y<sub>7</sub>Fe<sub>5</sub> Amorphous Alloys</b> H.W. Yang, M.J. Tan, R.D. Li and J.Q. Wang	76
<b>Structure and Properties of Zirconium Alloy after Modification by Pulse Ion Beam</b> E.V. Berezneeva, N.S. Pushilina, D.V. Berezneev, I.P. Chernov, A.M. Lider and M. Kreoning	82
<b>Effect of Sintering Conditions on the Blasting Property of Artificial Aggregates Made from Dredged Soil</b> S.G. Kang and S.N. Jo	86
<b>Investigation of Hydrogen Distribution from the Surface to the Depth in Technically Pure Titanium Alloy with the Help of Glow Discharge Optical Emission Spectroscopy</b> A.M. Lider, N.S. Pushilina, V.N. Kudiiarov and M. Kreoning	92
<b>Experimental Investigation of CO<sub>2</sub> Separation from Hard Coal Flue Gases by 100 cm<sup>2</sup> Molten Carbonate Fuel Cell</b> J. Milewski, W. Bujalski, M. Wołowicz, K. Futyma, J. Kucowski and R. Bernat	97
<b>Oxidic Composite for Dental Purposes: Effect of the Laminin 1 Adsorption on Cells Growth</b> M.G. Faga, F. Mussano, S. Carossa, A. Vallée, G. Martra and S. Coluccia	104
<b>Effects of Substituting Ni with Mn on Structure and Hydrogen Storage Characteristics of as-Spun Mg<sub>2</sub>Ni-Type Alloys</b> Y.H. Zhang, C. Xu, C. Zhao, H.T. Wang, T. Yang and D.L. Zhao	109

<b>Abrasion Resistance of Alumina-Titanium Dioxide Coating at High Temperature</b> Z.F. Cheng, H.S. Ding, H. Rong and L.G. Zhao	115
<b>The Study on the Removal of Ammonia Nitrogen in Wastewater by Thin Film Coating Photo-Catalytic Oxidation Process</b> H.J. Joo, J.S. Choi, D.W. Kwon and S.C. Hong	119
<b>Modeling Wood Density of Larch Using Random Effects Models</b> Y.B. Liu and L.C. Jiang	124
<b>A Comparative Study on Electrochemical Behavior of (La,Sr)FeO<sub>3</sub> and (La,Sr)FeO<sub>3</sub>-(La,Sr)MnO<sub>3</sub> Anodes for Solid Oxide Electrolysis Cells</b> J. Wang, Y. Zhang, W.L. Guo, T.X. Liang, C.S. Deng and J.M. Xu	128
<b>Solid State Bonding of CuCrZr to Duplex Stainless Steel</b> H.S. Lee, J.H. Yoon, J.T. Yoo and J.U. Choi	136
<b>The Limiting Dome Height Tests and Formability of Magnesium Alloy Sheet AZ31B</b> X.W. Ma, F. Wang and G.Q. Zhao	140
<b>Influence of Substrate on Structure and Magnetic Properties of Bi<sub>0.9</sub>Nd<sub>0.1</sub>FeO<sub>3</sub> Thin Films by Radio Frequency Magnetron Sputtering Method</b> L.L. Li, Q.X. Liu, Y. Zou, X.G. Tang and Y.P. Jiang	146
<b>Reaction of Magnesium Hydride with Water to Produce Hydrogen</b> C.H. Chao and T.C. Jen	151
<b>Nitric Acid Activated Carbon Aerogels for Supercapacitors</b> Y.J. Li, X.Y. Ni, J. Shen, D. Liu and N.P. Liu	158
<b>Research on the Elastic Property of Three New Superhard Materials</b> F. Li, Q. Hui, J. Ao, J. Wang, C.M. Li and Z.Q. Chen	165
<b>Optical Properties of Films of Graphite Oxide, Reduced Graphite Oxide and its Intercalated Compounds with Ammonium Dodecahydro-<i>closo</i>-Dodecaborate</b> A.A. Karpenko and V.I. Saldin	170
<b>Enhanced Photocatalytic Activity of TiO<sub>2</sub>/Graphene Oxide Nanocomposites Prepared by the Sol-Gel Method</b> C.H. Cao	176
<b>Composite Anisotropic Conductive Film</b> C.M. Lin	182
<b>Rapid Discrimination of Fermented Cordyceps Mycelium Powder by Near-Infrared Spectroscopy (NIRS)</b> N. Xu, W.Q. Luo and H.Q. Yang	189
<b>Supercontinuum Generation in Nonperiodic Photonic Crystal Fibers and its Application in Frequency Metrology</b> J.L. Wei, K. Li and Y.Y. Zuo	194
<b>Nonlinear Oscillations of Functionally Graded Materials Rectangular Thin Plates with Parametrical and External Excitations</b> X.L. Bian and S.B. Li	200
<b>High Flux Nanofiltration Membranes Prepared by Dynamic Self-Assembly of PSS-<i>co</i>-MA and PAH for CuCl<sub>2</sub> Removal</b> H.Y. Deng, Q.C. Chen, Z.G. Le, B.K. Zhu and Y.Y. Xu	204
<b>Finite Element Analysis for the Influence of Nanoparticles on the Thermal Residual Stress in Fiber Reinforced Composite</b> X.L. Wang, Z. Luo, H.J. Jing and H.A. Wu	212
<b>Study of the Effect of MoS<sub>2</sub> and PTFE Based Coatings on Adhesive Wear of Stainless Steel</b> T. Thana and K. Tuchinda	216
<b>Graphene Oxide Oxidized by NaClO as a Highly Effective Adsorbent for Fast Removal of Dye Rhodamine B</b> J.Y. Chen, Y. Liu, J.J. Gou and Y.M. Hao	223
<b>Rare Earth Luminescent Materials in Landscape Lighting Application</b> L. Zhu, L. Chen and W.D. Tan	227
<b>Effect of Electron Beam Welding on Microstructure and Mechanical Properties of Spray-Deposited Al-Zn-Mg-Cu Alloy</b> F. Wang, Y.T. Zuo, B.Q. Xiong, Y.G. Zhang, H.W. Liu, Z.H. Li and X.W. Li	230
<b>Temperature Analysis for Circumferential Electric Discharge Milling and Mechanical Grinding Compound Machining of SiC Ceramic</b> R.J. Ji, Y.H. Liu, C. Zheng, Y.Z. Zhang and F. Wang	236

<b>Effect of Fast Prototyping Means on the Fatigue Strength of High Carbon Steels</b> R. Puff and R. Barbieri	241
<b>A Design Concept of an Orthopedic Bone Drilling Mechatronics System</b> V. Kotev, G. Boiadjev, T. Mouri, K. Delchev, H. Kawasaki and T. Boiadjev	248
<b>Creep Behavior of 409L and 436 Ferritic Stainless Steels Applied for Automotive Exhaust System</b> H.Y. Chiu, C.M. Kuo and H.S. Wang	252
<b>Numerical Simulation on Temperature and Stress Field of Multi-Pass Welding of Thin Stainless Steel Plate</b> Y. Chen, J.M. Han, J. Tan, H.F. Du and J.Q. Wang	258
<b>Effect of Heat Treatment on the Microstructure and Hardness of a Newly Developed Plastic Injection Mold Steel</b> Y.P. Zeng and W. Yang	263
<b>The Research of the High Speed Steels Produced by Powder and Casting Metallurgy from the View of Tool Cutting Life</b> K. Monkova, P. Monka and D. Jakubčzyová	269
<b>A New Model of Predicting the Hydrogen Element in Coal-Fired</b> X.Q. Wen and Z.M. Xu	275
<b>Thermodynamics Study on the Theophylline-Nicotinamide Cocystal</b> J.J. Guo, L.P. Dang and H.Y. Wei	280
<b>Effect of Grain Size and Annealing Condition on Grain Boundary Segregation of Carbon Atoms in ULC Steel</b> Y. Cui, A.M. Ji, Y.L. Feng, R.Z. Wang and Q.L. Yong	286
<b>What Is the Optimum Cover Factor?</b> X.Y. Yang, L. Wang, G.P. Guan, Y.L. Li, L. Peng, Y. Guan, S.L. Zeng and W.M. King	292
<b>Effect of Coiling and Normalizing Annealing on the Microstructure of a Newly Developed Cold-Rolled Non-Oriented Electrical Steel</b> Y.P. Zeng and H.J. Cui	298
<b>Influence of Porosity on the Mechanical Properties of Cu/LDPE Porous Composites for Intrauterine Contraceptive Devices</b> M. Ge, X.P. Xia, C. Xiao, L. Xiao and S.Z. Cai	304
<b>Hydrogen Permeation Behavior through HSLA Steels and its Implications on Hydrogen Embrittlement Susceptibility</b> T.M. Zhang, W.M. Zhao, W. Guo and Y. Wang	310

## Chapter 2: Applied Mechanics and Mechanical Engineering

<b>Time Frequency Analysis of Femoral Doppler Ultrasound Signals by AR Modelling</b> L. Mahieddine and B.R. Fethi	319
<b>Study of a Wave Absorber in Various Distance Placed in a Sinusoidal Propagate Wave</b> Z.Z. Yuan, B.S. Chauhan and H.C. Lim	326
<b>Mechanical and Electrical Products Reliability Estimation under Weibull Distribution Based on Accelerated Life Test</b> B. Wan, G.C. Fu and L. Wang	332
<b>Structural Behavior of Reinforced Concrete Beams Strengthened with Carbon Fiber Reinforcement Polymer Plate</b> S.Y. Seo	338
<b>Analysis on Displacement Performance Affected by Machining Errors of Single-Notch Right Circular Flexure Hinge</b> J.Y. Shen	343
<b>Experimental and Numerical Study on Seismic Performance of Flat Columns under Bilateral Cyclic Loading</b> Z.F. Ma, Z.D. Lu, J.T. Yu and Z.H. Cai	347
<b>Reliability of Gravity Foundation in Coral Sands Subject to Dynamic Wind Load</b> Z.Q. Cheng, P. Yang and H.B. Jiang	355
<b>Experimental Study on Bond-Slip Constitutive Relation between CFL and Concrete</b> X.H. Zheng, P.Y. Huang, X.Y. Guo and Q. Han	359

<b>Modified Friction Stir Channeling: A Novel Technique for Fabrication of Friction Stir Channel</b>	
A. Rashidi, A. Mostafapour, S. Salahi and V. Rezazadeh	365
<b>Channel Formation in Modified Friction Stir Channeling</b>	
A. Rashidi, A. Mostafapour, V. Rezazadeh and S. Salahi	371
<b>Static Aeroelasticity Analysis of High Aspect Ratio Wing and the Jig-Shape Design Based on Multi-Block Structural Grid</b>	
Y. Liu, J.Q. Bai and J. Hua	377
<b>Modification for Quantitative Analysis of Welding Residual Stress by X-Ray Stress Analyzer</b>	
Z.W. Zhang, Q. Yao, A.P. Wu and L.Z. Gong	384
<b>Acoustic Transceiver Optimization Analysis for Downhole Sensor Data Telemetry via Drillstring</b>	
A.M. Ning, C. Li and Z. Liu	389
<b>Study on Mechanical Properties of Cement Clinker and Limestone by Hertzian Indentation Method</b>	
X.F. Wang	395
<b>Acoustic and Vibration Characteristics of Finite Cylindrical Shell-Circular Plate Based on Lagrange Equations</b>	
Q.Z. Zhou, D.S. Wang and S. Yang	401
<b>Guiding Solid Elastic Waves to Arbitrary Paths by Isotropic Materials</b>	
C.C. Xiang and J. Hu	406
<b>The Utilization of Heat Pipe on Cold Surface of Thermoelectric with Low-Temperature Waste Heat</b>	
Z. Djafar, N. Putra and R.A. Koestoer	410
<b>Study for the Method of Pressure Ease in Metro Transfer Station</b>	
N. Chen, Y.Y. Chen and G.H. Zhang	416
<b>Use of Nanofluids for Enhanced Natural Cooling of Discretely Heated Enclosures</b>	
R. Ben-Mansour and M.A. Habib	422
<b>The Influence of Geometry, Manufacturing Asymmetry and Asymmetric Excitation on Vertical Vibration of a Mechanical System</b>	
M. Svoboda and J. Soukup	429
<b>The Design of FlexRay-Based Node Communication</b>	
G. Jin and X.H. Song	435
<b>Investigations of an Ion Transport Membrane Reactor Specially Designed for a Power Cycle</b>	
M. Nemitallah, M.A. Habib and R. Ben-Mansour	440
<b>Study on the Electromechanical Coupling Performance of Bimorph Piezoelectric Cantilever</b>	
K. Zhang, D.S. Wang and Q.Z. Zhou	447
<b>Measurements of Residual Stress and Angular Distortion of 7075 Aluminum Alloy after Gas Tungsten Arc Welding</b>	
S.J. Wu, C.W. Chung and C.M. Kuo	452
<b>A Study on the Thermal Load Saving of an University Office Building with Passive Items</b>	
S.T. No and J.Y. Kim	457
<b>A Study on the Vibration Characteristics of the Optical Structure in the Aerial Vehicle and Optimisation Using Robust Design</b>	
B.J. Kim, J.H. Lee, H.B. Lee, D.Y. Jung and S.S. Cheon	462
<b>Evaluation of Mechanical and Thermal Stresses in Polymer Gear Teeth through Simulation Approach</b>	
P. Lindholm and J. Qin	468
<b>Vibration Fault Diagnosis of Rotating Machinery Using PSO-Based Radial Basis Function Network</b>	
H.C. Sun, C.M. Huang, Y.C. Huang and H.F. Chen	474
<b>Residual Strength of the CFRP- Strengthening Small Concrete Columns in Fire Situation</b>	
C.R. de Oliveira and A. Lopes Moreno	481
<b>Mechanical Structural Optimization and Research for an Intelligent Vehicle Model</b>	
C.J. Leng, H.Y. Xiang, X.Z. Zhou and J.J. Huang	486
<b>Traction Motor Base Multi-Condition Finite Element Strength Analysis</b>	
H.Y. Xiang, Z. Li and C.J. Leng	490

<b>Experimental Study on Leaf-Stripping Mechanism of Separating Machinery for Corn Stalk Skin Flesh Leaf</b> K.Q. Yu	494
<b>The Finite Element Analysis of Temperature Cracking Propagation Process of Pouring Mass Concrete</b> Y. Li, W.Y. Dong and B. Wang	499
<b>An Advanced Technology for Enhancement of Transmission Loadability Using FACTS Devices</b> C.M. Huang, Y.C. Huang and K.Y. Huang	502

### **Chapter 3: Manufacturing Engineering, Design, Modeling and Simulation in Manufacture and Industry**

<b>Adapting Optimal Operation Strategy for the Chiller Plant of a Semiconductor FAB</b> C.Y. Kao, K.H. Yang, S.C. Tang and L.M. Chang	511
<b>Study of Wear Phenomena of Coatings for Die-Casting</b> G. Gautier, M. Faga, V. Tebaldo, G. Martra and F. Cartasegna	520
<b>Handling Dynamic Concerns of Designing a Platform for Mechatronic Software Systems</b> E. undrea and G. Steinke	525
<b>Development of the Environment-Friendly Wild Jujube Date Pit Taking Machine</b> Q. Shan and Y. Chen	531
<b>A Methodology for Systematic Geometric Error Compensation in Integrated Inspection and Machining</b> Y.J. Jiang	535
<b>The Operational Modal Analysis of an Industrial Sewing Machine</b> L. Zhang, Y.J. Li and Y.M. Ma	541
<b>Feature Size Measurement of Multihole Sheet Metal Part Based on HALCON</b> B. Han, H.Y. Xiang, Z. Li and X.Z. Zhou	546
<b>Finite Element Analysis for the Design of Branched Artificial Blood Vessel of Aortic Arch</b> F.J. Wang, L. Zhang, L. Wang, C.J. Li, P. Ge, M.Q. Lian and X. Li	550
<b>Optimization of the Compositions of PEG/PMMA Binder System in Ceramic Injection Moulding via Water-Debinding</b> X.F. Yang, W. Liu, Z.P. Xie and X.W. Xu	556
<b>Implementation and Motion Planning of a Dual Arm Service Robot</b> H.B. Tan, Q.X. Cao and C.T. Leng	561
<b>The Controlling Research of the 3D Bionic Snake-Like Robot Based on the Arduino</b> T.L. Song, Y.P. Lu and H.Q. Liu	570
<b>The Optimization Design of High Precision Long-Range Cartesian Coordinate Robots' Drive System</b> X.T. Han, Y. Wang and H.T. Tong	574
<b>A High By-Pass Ratio Turbofan Model Based on CMF Method</b> B. Wang, X. Wang and Y. Liu	578
<b>Multidisciplinary Design Optimization of Small Canister-Launched Space Launch Vehicle Using Genetic Algorithm</b> F.M. Villanueva, L.S. He and D.J. Xu	583
<b>Three-Dimensional Computation Design of a Novel Sediment Sampler</b> Z.J. Cao and X.B. He	589
<b>Technical Regulation for Numerical Simulation on Processing Technology of Large Forgings</b> P. Zeng, G. Fang and L.P. Lei	595
<b>Based on Static Interval Finite Element Method of Analysis of Rigid Frame Structure</b> Y. Li, X.W. Han and W.Y. Dong	599
<b>Development of a Therapeutic Device for Osteoporosis</b> T. Yue and L. Tao	603
<b>A Quantum Repeater Based on Entanglement Purification and Entanglement Swapping</b> Z.Z. Zhou, W. He, C.D. Zhu and Y. Wang	607
<b>The Total Design of Reverse Engineering CAM Module Based on Pro/NC</b> J. Fan	612

<b>Prediction of the Slagging Characteristics of Coal Ash Based on Symmetric Fuzzy Cross Entropy and Vague Sets</b> X.Q. Wen	617
<b>Dynamic Time History Analysis on Groundwater Hydraulic Tunnel under Three Dimensional Viscoelastic Boundary Conditions</b> J. Yao, L. Cao, H.M. Wang, L.J. Zhang, L. Wu and S.G. Qian	622
<b>Numerical Analysis on the Influence of the Unsteady Effect upon the Flow Characteristics in a Human Airway</b> K.H. Sung and H.S. Ryou	628
<b>The Interface Design and Usability Evaluation of Interactive Virtual Reality Navigation System</b> K.W. Su, H.Y. Wang, Y.Y. Wu and N.H. Kuo	635
<b>Numerical Study on Aerodynamic Characteristics of NACA0015</b> S.J. Lee, E.C. Jeong and H.C. Lim	640
<b>Policy-Combination Oriented Optimization for Supply Chain Simulation</b> W.Z. Tan, X. Li and Y.T. Chai	646
<b>Design and Implementation of the Simulation Information System of Marine Oil Spill</b> Z.D. Rong, B. Yang and H.P. Qu	652
<b>Interface Design of the Location-Based M-Tourism Application</b> K.W. Su, C.H. Wang, P.H. Chen and Y.Y. Wu	658

## **Chapter 4: Control and Automation, Applications of Tracking and Information Technologies**

<b>Tracking Control of an Uncertain MEMS Resonator via Adaptive Terminal Sliding Mode Control</b> C.C. Yang and R.H. Guo	665
<b>Performances Analyzing of Parallel Inverter System Based on an Improved Fuzzy Control Method</b> H.L. Wang, J. Wang, M.Q. Wang, X.R. Cui, L. Lin and Z. Sun	671
<b>Energy Information Communication Technologies for Smart Home Applications</b> H.C. Sun, Y.C. Huang and H.F. Chen	679
<b>A Method to Identify Bird Constitutive Model and its Parameters</b> Y.K. Zhang, Y.L. Li and H.B. Zhang	686
<b>Research and Development of Quality Traceability System Based on Intelligent Services for Bee Products</b> Y.G. Kong, X.F. Hu, T.J. Chen and Z.T. You	694
<b>The Design of Bee Products Quality Tracking System Based on Android Smartphone</b> Y.G. Kong, T.J. Chen, X.F. Hu and Z.T. You	700
<b>Mean Shift Tracking with Advanced Background-Weighted Histogram</b> A.Y. Alemu, Z.J. Pei and J. Zhang	706
<b>Design and Implementation of Testing and Management System on Special Information Security Products</b> Z. Xu and H.P. Qu	711
<b>Reliability of Duffing-van der Pol Oscillator with Delayed Feedback Control under Wide-Band Noise Excitation</b> T. Zhang, C.S. Feng and Q.Y. Wang	717
<b>Integrated Design of Feedback Controller and UIO: An LMI Solution</b> Y. Liu, A. He, B. Wang and X. Wang	723
<b>The Design of Simultaneous Location and Mapping System for Intelligent Vehicle in Indoor Environment</b> L. Wang, X.L. Lu and Z.H. Cao	729
<b>Building Cyberinfrastructure for Data Management and Sensor Control in Ocean Observation</b> X. Li, M. Jin, Z.Y. Liu, R.S. Huang and Z.H. Guo	735
<b>Design of Prototype System for Seafloor Observatory Network</b> X. Li, F.X. Gao, L.F. Zhou and T.X. Yan	740



<b>Development of an Omnidirectional AGV with Global Localization System</b> C.T. Leng, J.J. Du, Q.X. Cao, X.X. Zhu and Z. Huang	746
<b>Sensorless Vector Control System Design of Permanent Magnet Synchronous Motor</b> Z.L. Liu and H.B. Ao	752
<b>Linear-Matrix-Inequality-Based Fault Diagnosis for Gas Turbofan Engine Using Eigenstructure Assignment Principle</b> Y. Liu, D.L. Tan, B. Wang and X. Wang	759
<b>Automated FE Analysis for Heat Sink of LED Modules</b> J.S. Lee, D.K. Park and Y.J. Choi	765
<b>Design of Bamboo Strip Detection System Based on Labview and Matlab Mixed Programming</b> L.P. He, S.X. Song, L. Liu and X.M. Jiang	772
<b>Research of Solar Photoelectric Micro-Power Supply on Chip</b> Y.T. He, L.X. Xiao and R.M. Liu	776
<b>Hybrid Differential Evolution for Power Economic Dispatch Problems Considering the Incorporated Cost Model</b> C.L. Chiang	782
<b>An Overview of the Recommender System</b> L. Zhao, R.R. Yang, M. Zhai and F.M. Liu	787