## **Table of Contents**

**Preface, Committees and Sponsors** 

## **Chapter 1: Industrial Engineering, Product Design, Numerical Modelling and Simulation**

| CFD Simulation and Study of Air Pump Loss on Two Kinds of Retarders with Different Turbulent Structures  |          |
|--|----------|
| Z.C. Song, H.Y. Li and C. Wu   | 3        |
| Study on a Flutter Stability Control Measure of Fabricated Steel Truss Bridge C.L. Zhang, Q. Wang, X.H. He, E.J. Bian and J. He                        | 7        |
| Thermo-Structural Coupling Numerical Analysis of Rectangular Vessel C.L. Tian, S. Zhou and L.Y. Han  | 14       |
| A New Redundant-DOF Wearable Master Device with Force Feedback X.L. Zhang, Y. Liu, X.X. Wu and W.S. Chou   | 18       |
| Finite Element Analysis of Two Wheels Scooter Based on Solidworks Z.D. Huang, Y.P. Du, L. Zhao, K.G. Zhu, H. Ji and R.S. Wang                          | 24       |
| Designing and Simulating a Mechatronic Inerter D. Li and Y.Z. Liu  | 28       |
| Analysis, Design and Simulation of Transmission System in a Mini Vehicle Weapon System (Unmanned Ground Vehicle) W. Berrah and D.G. Li                 | 33       |
| Prediction of the Development of Non-Equilibrium Turbulent Boundary Layers Based on Modified Log-Wake Law  | 39       |
| T. Zhang, X.J. Zhu, F. Peng and S.S. Min  A New Type of Underwater Salvage Dilator with Seawater Hydraulic Drive F.M. He, L.Q. Qiu and F.W. Yu         | 39<br>44 |
| The Spiral Space Form of Exhibition Buildings Based on Topology and Bionics C.F. Li, J.J. Huang, H.T. Shi and L.Y. Chen                                | 48       |
| <b>Portable Fire Water Branch Stents Structure Design and Kinematical Simulation</b> S.W. Wang, H.Y. Qin and W. Wei                                    | 55       |
| On Surface Continuity in the Procession of Product Design Y. Cai and L.Z. Li   | 60       |
| <b>3-D Model Reconstruction and Mold Flow Simulation for an Existing Shaped Part</b> D.Y. Chang and J.Y. Chang   | 65       |
| Analysis of Surge Shaft Excavation Process Based on 3-Dimensional Finite Difference Method   |          |
| Z.Z. Shen, N. Wang, N. Yao and C.X. Shao<br>Singular Configurations Analysis of a Redundantly Actuated Parallel Manipulator                            | 69       |
| J.L. Gong, J.X. Pang and Y.F. Zhang  | 75       |
| Two-Machine Flowshop Problem with Release Dates, Rejection and Non-Availability Interval on the First Machine X. Xie, X.Y. Kong, Y.Y. Zheng and K. Wei | 80       |
| Internal Flow Field Analysis of Air-Suction Roller-Type Precision Metering Device C. Ren, Q.H. Lai, Z.G. Zhang, X.J. Gao, Z.Y. Wang and Y.Y. Li        | 84       |
| The UG Parametric Design of Vertical Horizontal Circular Vibration Drier Chassis X.B. Li   | 89       |
| <b>Instructional Design Integrated with Quality Function Deployment (QFD) and TRIZ40</b> C. Louhapensang and S. Seviset                                | 93       |
| Structure Design Based on Mechanism and Materials Property<br>H.L. Liu, B.S. Liu and X.N. Li   | 100      |
| Analysis of the Pressure and the Gasleak of the Piston Ring of a New Double-Rotor Engine W.M. Li, C.Y. Pan and I.Z. Chen                               | 104      |

| <b>Design Optimization of Hub for 3-Bladed Horizontal Axis Tidal Turbine</b> M. Kamran, Z.Y. Li, S.F. Zhu and F.K. Kong   | 111                                    |
|---|--|
| A New Method of LCMV Algorithm in GNSS Anti-Interference X.Q. Zhang, Y.H. Diao and Z.Y. Tian  | 115                                    |
| Research on Damage Technology of Variable-Structure Following Warhead G. Li, B.H. Yuan, X.Y. Sun and H.H. Liu   | 119                                    |
| Analysis of Geometric Characteristic of Missile Vertical Launching System Guide Rail  | 123                                    |
| J.C. Yang and Y. Yang  Finite Element Analysis of Magnetization Reversal Effect Based on Ferromagnetic  | 123                                    |
| Specimens X.W. Xi, S.K. Ren and L.H. Yuan   | 127                                    |
| <b>Design of Electronic Seal Terminal for Tank Vehicles</b> Y.F. Yang, J. Wang, X.J. Liu, X.J. Yang and Y. Hu   | 133                                    |
| Parametric Modeling and Analysis of Self-Loading Container Vehicle Based on ANSYS W.B. Wang, K. Cheng and L. Cheng  | 137                                    |
| The Automobile Tension Bar Time-Varying Reliability Sensitivity Analysis S.S. Liu, B.Q. Shi, W.Y. Zhang, X.J. Fu and Y.W. Wu  | 143                                    |
| The Applied Research of Ergonomics in Lying Plate of Repair F.X. Li   | 148                                    |
| Virtual Reality Technology Applied in Automobile Modeling Design X.Y. Pan and X.J. Wei  | 154                                    |
| Distribution Substation Site Planning Method Summary and Discussion H.K. Li, M.J. Lv and J.G. Liu   | 158                                    |
| Research of the Design and Simulation of Ultrasonic Focusing System with Phased Array Z.H. Liu, J.W. Jia and G. Xiong   | 162                                    |
| Coanda Effect on the Impact of Distribution Characteristics of Oil-Air Annular Flow Q.G. Sun, D.X. Chen, X.S. Wang and Z.H. Zhou  | 166                                    |
| Q.G. Sull, D.A. Chell, A.S. Wallg and Z.H. Zhou   | 100                                    |
| <b>Chapter 2: Manufacturing Technology and Processes</b>  |  |
| 1 8 8   |  |
| Optimization of Multiple Performances for EDM in Gas Media Using Grey Relational  |  |
| Optimization of Multiple Performances for EDM in Gas Media Using Grey Relational Analysis F.P. Chuang, Y.C. Lin, H.M. Chow and A.C. Wang  | 173                                    |
| Optimization of Multiple Performances for EDM in Gas Media Using Grey Relational Analysis F.P. Chuang, Y.C. Lin, H.M. Chow and A.C. Wang A Heuristic Algorithm for Solving Multi-Crane Scheduling Problem in Batch Annealing  | 173                                    |
| Optimization of Multiple Performances for EDM in Gas Media Using Grey Relational Analysis F.P. Chuang, Y.C. Lin, H.M. Chow and A.C. Wang A Heuristic Algorithm for Solving Multi-Crane Scheduling Problem in Batch Annealing Process X. Xie, X.Y. Kong, Y.Y. Zheng and K. Wei   | 173<br>179                             |
| Optimization of Multiple Performances for EDM in Gas Media Using Grey Relational Analysis F.P. Chuang, Y.C. Lin, H.M. Chow and A.C. Wang A Heuristic Algorithm for Solving Multi-Crane Scheduling Problem in Batch Annealing Process X. Xie, X.Y. Kong, Y.Y. Zheng and K. Wei Cold-Formed Thin-Walled Steel Framing Residential System Y.H. Zhang   |  |
| Optimization of Multiple Performances for EDM in Gas Media Using Grey Relational Analysis F.P. Chuang, Y.C. Lin, H.M. Chow and A.C. Wang A Heuristic Algorithm for Solving Multi-Crane Scheduling Problem in Batch Annealing Process X. Xie, X.Y. Kong, Y.Y. Zheng and K. Wei Cold-Formed Thin-Walled Steel Framing Residential System Y.H. Zhang Research on Recovery Technology of the By-Product Low-Pressure Steam of Ammonia J. Chen, G.S. Yin and Y. Xue  | 179                                    |
| Optimization of Multiple Performances for EDM in Gas Media Using Grey Relational Analysis F.P. Chuang, Y.C. Lin, H.M. Chow and A.C. Wang A Heuristic Algorithm for Solving Multi-Crane Scheduling Problem in Batch Annealing Process X. Xie, X.Y. Kong, Y.Y. Zheng and K. Wei Cold-Formed Thin-Walled Steel Framing Residential System Y.H. Zhang Research on Recovery Technology of the By-Product Low-Pressure Steam of Ammonia   | 179<br>183                             |
| Optimization of Multiple Performances for EDM in Gas Media Using Grey Relational Analysis F.P. Chuang, Y.C. Lin, H.M. Chow and A.C. Wang A Heuristic Algorithm for Solving Multi-Crane Scheduling Problem in Batch Annealing Process X. Xie, X.Y. Kong, Y.Y. Zheng and K. Wei Cold-Formed Thin-Walled Steel Framing Residential System Y.H. Zhang Research on Recovery Technology of the By-Product Low-Pressure Steam of Ammonia J. Chen, G.S. Yin and Y. Xue Generation of Technological Model for Multi-Stage Incremental Forming  | 179<br>183<br>187                      |
| Optimization of Multiple Performances for EDM in Gas Media Using Grey Relational Analysis F.P. Chuang, Y.C. Lin, H.M. Chow and A.C. Wang A Heuristic Algorithm for Solving Multi-Crane Scheduling Problem in Batch Annealing Process X. Xie, X.Y. Kong, Y.Y. Zheng and K. Wei Cold-Formed Thin-Walled Steel Framing Residential System Y.H. Zhang Research on Recovery Technology of the By-Product Low-Pressure Steam of Ammonia J. Chen, G.S. Yin and Y. Xue Generation of Technological Model for Multi-Stage Incremental Forming H. Zhu, W. Zhang and H.Y. Li  Chapter 3: Sensors, Controlling and Monitoring Technologies  | 179<br>183<br>187                      |
| Optimization of Multiple Performances for EDM in Gas Media Using Grey Relational Analysis F.P. Chuang, Y.C. Lin, H.M. Chow and A.C. Wang A Heuristic Algorithm for Solving Multi-Crane Scheduling Problem in Batch Annealing Process X. Xie, X.Y. Kong, Y.Y. Zheng and K. Wei Cold-Formed Thin-Walled Steel Framing Residential System Y.H. Zhang Research on Recovery Technology of the By-Product Low-Pressure Steam of Ammonia J. Chen, G.S. Yin and Y. Xue Generation of Technological Model for Multi-Stage Incremental Forming H. Zhu, W. Zhang and H.Y. Li   | 179<br>183<br>187                      |
| Optimization of Multiple Performances for EDM in Gas Media Using Grey Relational Analysis F.P. Chuang, Y.C. Lin, H.M. Chow and A.C. Wang A Heuristic Algorithm for Solving Multi-Crane Scheduling Problem in Batch Annealing Process X. Xie, X.Y. Kong, Y.Y. Zheng and K. Wei Cold-Formed Thin-Walled Steel Framing Residential System Y.H. Zhang Research on Recovery Technology of the By-Product Low-Pressure Steam of Ammonia J. Chen, G.S. Yin and Y. Xue Generation of Technological Model for Multi-Stage Incremental Forming H. Zhu, W. Zhang and H.Y. Li  Chapter 3: Sensors, Controlling and Monitoring Technologies  Research on Cam Contour Error of Grinding Machining X.M. Chen, Q.S. Han and B.Y. Peng Study on Stability of the High Rock Slope under the Flood Discharge Atomization and   | 179<br>183<br>187<br>192               |
| Optimization of Multiple Performances for EDM in Gas Media Using Grey Relational Analysis F.P. Chuang, Y.C. Lin, H.M. Chow and A.C. Wang A Heuristic Algorithm for Solving Multi-Crane Scheduling Problem in Batch Annealing Process X. Xie, X.Y. Kong, Y.Y. Zheng and K. Wei Cold-Formed Thin-Walled Steel Framing Residential System Y.H. Zhang Research on Recovery Technology of the By-Product Low-Pressure Steam of Ammonia J. Chen, G.S. Yin and Y. Xue Generation of Technological Model for Multi-Stage Incremental Forming H. Zhu, W. Zhang and H.Y. Li  Chapter 3: Sensors, Controlling and Monitoring Technologies  Research on Cam Contour Error of Grinding Machining X.M. Chen, Q.S. Han and B.Y. Peng Study on Stability of the High Rock Slope under the Flood Discharge Atomization and Rainfall Z.Z. Shen, B.S. Nie, L.Q. Xu, L. Yang and N. Wang  | 179<br>183<br>187<br>192               |
| Optimization of Multiple Performances for EDM in Gas Media Using Grey Relational Analysis F.P. Chuang, Y.C. Lin, H.M. Chow and A.C. Wang A Heuristic Algorithm for Solving Multi-Crane Scheduling Problem in Batch Annealing Process X. Xie, X.Y. Kong, Y.Y. Zheng and K. Wei Cold-Formed Thin-Walled Steel Framing Residential System Y.H. Zhang Research on Recovery Technology of the By-Product Low-Pressure Steam of Ammonia J. Chen, G.S. Yin and Y. Xue Generation of Technological Model for Multi-Stage Incremental Forming H. Zhu, W. Zhang and H.Y. Li  Chapter 3: Sensors, Controlling and Monitoring Technologies  Research on Cam Contour Error of Grinding Machining X.M. Chen, Q.S. Han and B.Y. Peng Study on Stability of the High Rock Slope under the Flood Discharge Atomization and Rainfall Z.Z. Shen, B.S. Nie, L.Q. Xu, L. Yang and N. Wang Research on Implementation and Design of Monitoring System for Distributed Micro Gird F.Q. Quan, H.T. Zhang, C.D. Li, Q.Q. Zhao, P. Yin, P.Y. Cong, H.Y. Zhang and H.L. Li   | 179<br>183<br>187<br>192               |
| Optimization of Multiple Performances for EDM in Gas Media Using Grey Relational Analysis F.P. Chuang, Y.C. Lin, H.M. Chow and A.C. Wang A Heuristic Algorithm for Solving Multi-Crane Scheduling Problem in Batch Annealing Process X. Xie, X.Y. Kong, Y.Y. Zheng and K. Wei Cold-Formed Thin-Walled Steel Framing Residential System Y.H. Zhang Research on Recovery Technology of the By-Product Low-Pressure Steam of Ammonia J. Chen, G.S. Yin and Y. Xue Generation of Technological Model for Multi-Stage Incremental Forming H. Zhu, W. Zhang and H.Y. Li  Chapter 3: Sensors, Controlling and Monitoring Technologies  Research on Cam Contour Error of Grinding Machining X.M. Chen, Q.S. Han and B.Y. Peng Study on Stability of the High Rock Slope under the Flood Discharge Atomization and Rainfall Z.Z. Shen, B.S. Nie, L.Q. Xu, L. Yang and N. Wang Research on Implementation and Design of Monitoring System for Distributed Micro Gird F.Q. Quan, H.T. Zhang, C.D. Li, Q.Q. Zhao, P. Yin, P.Y. Cong, H.Y. Zhang and H.L. Li Research on the Quadrature Demodulation-Based Quartz Crystal Microbalance | 179<br>183<br>187<br>192<br>199<br>205 |
| Optimization of Multiple Performances for EDM in Gas Media Using Grey Relational Analysis F.P. Chuang, Y.C. Lin, H.M. Chow and A.C. Wang A Heuristic Algorithm for Solving Multi-Crane Scheduling Problem in Batch Annealing Process X. Xie, X.Y. Kong, Y.Y. Zheng and K. Wei Cold-Formed Thin-Walled Steel Framing Residential System Y.H. Zhang Research on Recovery Technology of the By-Product Low-Pressure Steam of Ammonia J. Chen, G.S. Yin and Y. Xue Generation of Technological Model for Multi-Stage Incremental Forming H. Zhu, W. Zhang and H.Y. Li  Chapter 3: Sensors, Controlling and Monitoring Technologies  Research on Cam Contour Error of Grinding Machining X.M. Chen, Q.S. Han and B.Y. Peng Study on Stability of the High Rock Slope under the Flood Discharge Atomization and Rainfall Z.Z. Shen, B.S. Nie, L.Q. Xu, L. Yang and N. Wang Research on Implementation and Design of Monitoring System for Distributed Micro Gird F.Q. Quan, H.T. Zhang, C.D. Li, Q.Q. Zhao, P. Yin, P.Y. Cong, H.Y. Zhang and H.L. Li   | 179<br>183<br>187<br>192<br>199<br>205 |

| Design and Implementation of the Evidence Obtaining Front-End of Vehicle-Mounted Video Surveillance System J. Zhang                                 | 223 |
|---|-----|
| An Improved Background Update Algorithm and Application in Traffic Engineering S.S. Zhu, H.Y. Zhang, C.Y. Zhang and H.J. Zhu                        | 228 |
| Spring-Steel Pipe Fiber Bragg Grating Strain Sensor<br>L. Peng, C. Li, Z.G. Zhao, S. Wu and Y.N. Li   | 233 |
| Study on Combined Anti Seepage Characteristics of Upper Reservoir for a Pump Station B. Zhang, Z.Z. Shen, L. Yang, Y.Q. Zhou and J.Z. Yu            | 238 |
| Research on Motor Vehicle Exhaust Pollution Monitoring Technology X.L. Gao, T.J. Hu and K. Wang   | 244 |
| <b>Prestin Expression in Cochlea of Bats Using Different Echolocation Systems</b> Q.J. Li, X.D. Zhang, T.T. Xu and J.X. Yin                         | 248 |
| Chapter 4: Tribology, Vibration and Testing Technologies  |     |
| The Experimental Study of Unload on Temperature Characteristics of Hydraulic Retarder C. Wu, Z.C. Song, S.S. Tang and W.G. Shan                     | 255 |
| Effect of Gear Installation Flatness in Main Reducer on Gear Mesh Vibration Based on <i>Adams</i> Simulation J.L. Xu and T. Yan                     | 262 |
| Vibration Modal Analysis of the Full-Sized Medium Density Fiberboard C. Guan, L.J. Zhou, H.J. Zhang and K.H. Li                                     | 268 |
| Analysis on Vibratory Subsoiler Considering Slowly Varying Parameter L.L. Xin, C.Q. Li and J.H. Liang   | 274 |
| Improving Tribological Behavior of 2-Stroke Marine Diesel Engine Piston Ring by Cylinder Liner Surface Texturing S.A. Mohamad, Q. Zheng and X.Q. Lu | 278 |
| Study on the Flow Field of an Undershot Cross-Flow Water Turbine Y.R. Li, Y. Nishi, T. Inagaki and K. Hatano  | 285 |
| <b>Double Binding Effect on the Stability of the Structure</b> C.Y. Zhou, J.R. Yang, Y. Bai and H.X. Su   | 292 |
| Analysis of Vibration Characteristics of a Cracked Rotor X.X. Chu and F.L. Wang   | 296 |
| <b>Modeling and Modal Analysis on Capacitive Micromachined Ultrasound Transducers</b> Y. Li and P.Y. Zhang  | 300 |
| <b>Dynamic Modeling and Optimization on the Automatic Balancing of a Washing Machine</b> Z.K. Hong and Y.F. Chen                                    | 304 |
| <b>Study on Random Response Analysis for the Isolation Cylinder Clamp</b> D.L. Sun, Z.L. Du, S.Y. Hou and R.D. Liao                                 | 310 |
| Chapter 5: Robotics and Control Systems   |     |
| Intelligent Synchronous Control for Gantry Position Stage<br>P.H. Chou, F.J. Lin, W.C. Chen and Y.M. Chen   | 317 |
| Analysis of Elastic Motion Stability of Flexible Manipulator Arm Based on Lyapunov Stability Theory G.R. Liu, W.B. Zhou and R.F. Liu                | 321 |
| Analysis of Elastic Motion Stability of Flexible Manipulator Arm Based on Roth Criterion of Control System  | -   |
| G.R. Liu, L.F. Niu and X. Tian  Optimization of the Method to Palletize Firebricks by Robot Based on Pareto Genetic                                 | 330 |
| Algorithm L. Liu, G.D. Wang, R.Y. Xiao and R.S. Wang  | 337 |
| Kinematics Model of the 6-DOF Underwater Manipulator and Control System Design Based on PLC Technology T. Yao and Z.Y. Chang                        | 343 |
| 1. 1 w with 2.1. Chang  | 213 |

| Hardware-in-the-Loop Simulation of a Dynamic Process by Compensation of the Transfer<br>System  |     |
|---|-----|
| C.K. He, J.Z. Zhang and L.F. Wang   | 347 |
| Investigation of the Embedded Control System of Diesel Injector Nozzle Grinding S.Z. Yang, T. Yu and Y.J. Bai                                     | 352 |
| The Research and Practice of Product Design in a Guilding Robot R. Long, H. Cao and J. Li   | 358 |
| Study of Elevator Flexible Sheet Metal Processing Production Line Based on Open CNC System  |     |
| S.G. Niu, L. Xue and G.Y. Zhou  | 364 |
| Chapter 6: Applied Research in Power Engineering  |     |
| Cognitive Evaluation of Digital Monitoring HCI in Nuclear Power Plant Based on Eye-<br>Tracking Technology  | 271 |
| S.Y. Yan, J. Xiao, L. Liu, Y.H. Wang and J.L. Zhang  The Study of Friction Power Loss of Piston Group of a Twin-Rotor Engine                      | 371 |
| J.Z. Chen, C.Y. Pan, W.M. Li, L. Zhang and H. Chen  | 375 |
| Safety Analysis of Plant Slope of Haokou Power Station Z.Z. Shen, Y.F. Sun, L.Q. Xu and N. Wang   | 382 |
| Parameters Optimization on Method of Improving Diesel Nozzles' Flow Coefficient and   |     |
| Flow Uniformity Y.J. Bai, H.X. Cai and T. Yu  | 386 |
| <b>66kv Capacitor Cancellation of Research and Application of External Fuse</b> M.J. Lv, J.X. Wang and F.J. Tian                                  | 391 |
| <b>Adjusting the Degree of Compensation of Small Current Grounding System Petersen Coil</b> X.D. Zhao, F.Z. Liu and Y. Tian                       | 394 |
| Automatic Tuning Arc Suppression Coil Current in a Small Grounding System H.L. Zhang, Y.B. Zhao and F.Z. Liu                                      | 398 |
| Simulation Research on Variable Frequency Flash Based on Blind Source Separation M.D. Li, Y.B. Duan and Y. Wang                                   | 402 |
| Chapter 7: Materials Science, Technology and Application  |     |
| The Effect of Temperature on Preparing CuO Nanostructures for Changing of Electrical Resistance   |     |
| P. Chamninok, D. Polsongkram, K.S. An, J. Pongsuwan and S. Pukird   | 409 |
| A Study on Bending Behaviours of Aluminium Foam-Filled Tubes Y. An, C.H. Yang and P. Hodgson  | 413 |
| The Influence and Application of Stainless Steel to Modern Sculpture  |     |
| Q. Zhang and S.Y. Wang  Crack Initiation Observation in Early Stage of Rolling Contact Fatigue of SUJ2 Using a                                    | 417 |
| Single-Ball Apparatus K. Kida, S. Hazeyama, T. Sado, K. Mizobe and T. Shibukawa   | 421 |
| Failure Analysis of Single-Lap Single-Bolt Composite Joints with Countersunk Fasteners A. Xin and L.B. Zhao                                       | 425 |
| Tensile Strength Prediction of Out-of-Plane Composite Joints for Integrated Composite Cabins  | 420 |
| X.H. Zhou, D.H. Zhang and L.W. Zhou  Steel-Concrete Composite Box Beam Linear Buckling Analysis   | 429 |
| C.Y. Zhou, J.R. Yang, X.D. Yang and Z.C. Lai  | 433 |
| Effects of Grain Size on Crack Aspect Ratio and Crack Initiation Limit in Notched Specimen of Austenitic Stainless Steel (JIS SUS304) T. Matsueda | 438 |
| Effect of Twice Quenching on Prior Austenite Grains and Rotating Bending Fatigue Cracks   | .50 |
| in SUJ2 Steel<br>K. Mizobe, W. Matsuda, M. Matsushita, T. Shibukawa and K. Kida   | 443 |

| Study on the Effect of Humic Acid Acetamide on the Rheological Properties of Diesel Oil-  |     |
|---|-----|
| Based Drilling Fluids C. Ma, L. Li, H. Lu, X.B. Yuan and G. Wang  | 449 |
| A Comparative Study on the Oxidation of Fe-25Cr-7Ni-4Mo and Fe-25Cr-7Ni-2Mo-4W Steels   |     |
| S.M. Shin and J.P. Wang   | 453 |
| A Study on the Electrical Properties of Gan-Based Alpha Particle Detector Z.F. Zhu, X.C. Peng, J.J. Zou, L. Feng and R.B. Wang  | 457 |
| Thermo-Physical Properties of Magnetic Fluid and its Natural Convection Heat Transfer in a Horizontal Enclosed Rectangular Container Y.R. Li, T. Inagaki, H. Saito and M. Abe     | 461 |
| Thermo-Physical Properties of Phase Change Materials and those Natural Convection Heat Transfer in a Horizontal Enclosed Rectangular Container Y.R. Li, T. Inagaki and H. Kashiwa | 468 |
| Development on Silicon Rubber Elastic Composite Magnetic Abrasive and Research on Internal Polishing H.M. Chow, L.D. Yang, Y.F. Chen, Y.H. Huang and Y.C. Lin                     | 472 |
| Experiment of Effects of Oil Volume-Per-Cycle on Oil Film's Thickness under Oil-Air Lubrication   | 476 |
| Q.G. Sun, Z.H. Zhou and Y.F. Wang   | 476 |