

Table of Contents

Preface and Committees

Chapter 1: Research in Numerical Simulation and Optimisation

Numerical Simulation on Shock Initiation of Double-Shell Charges by High Velocity Impact X. Liu and Q.M. Zhang	3
Research on Simulation System of Aero-Generator X.J. Zang and J. Song	8
Real-Time Attitude Simulation of Aerocraft Using dSPACE Emulator and Three-Axis Turn Table D.C. Xie, Z.W. Wang and Q.H. Zeng	15
Electric Vehicle Transmission Gear Ratio Optimization Based on Particle Swarm Optimization Q. Gu and X.S. Cheng	20
Numerical Simulation Research on the Hydrodynamic Forces Acting on a Tanker in Oblique Motion C.S. Zhan	27
Study on the Efficiency Optimization of U-Shaped Curve Rail Type AS/RS H. Liu, Y.B. Huang and Y. Xing	33

Chapter 2: Characteristic Studies of Mechanical and Material Systems

Study on Sheet Bonding and Break Strength Characteristics J.S. Tao and P.S. Yang	41
Static and Dynamic Stiffness Characteristics Analysis of Hydro-Pneumatic Suspension J.H. Wei, H. Du and H. Lin	46
Evaluation of Tensile Properties of Pressure Vessel Materials by Shear Punch Test Method T. Ramesh, R.V. Prakash, S. Suresh and N. Raju	53
Analysis of the Dynamic Response of a Cracked Beam Structure D.N. Thatoi, J. Nanda, H.C. Das and D.R. Parhi	58
Visualization of Supersonic Non-Newtonian Liquid Jets A. Matthujak, C. Kasamnimitporn, W. Sittiwong and K. Pianthong	63
Deformation and Stresses Analysis in FG Rotating Hollow Disk and Cylinder Subjected to Thermal and Mechanical Load A.R. Khorshidvand and M. Javadi	68
Test and Numerical Analysis of Underwater Explosion on Circular Plates A.A.S. Koohsar, S.M.S. Nasereddini and E. Bazrafshan	74
Comparing of the Welding Atmosphere Moisture Effect on Hydrogen Distribution in TI-6AL-4V, Pure Commercial Titanium and TI-15V-3CR-3SN-3AL Weld Joints S.M.S. Nasereddini, A.A.S. Koohsar and E. Bazrafshan	80

Chapter 3: Chaotic States and Analysis of Systems

Design and Research of Electric Vehicle Driving System Based on SOPC Y. Zhao and H. Qi	87
Study on the Temperature Filed of Wet Dual Clutch Transmission during Starting Process X. Liu, X.S. Cheng, Y. Li, Q. Gu and Y.S. Wang	95
Research on Taylor Vortices in the Wedge-Shaped Air Gap of Evaporation Cooling Turbo Generator J.S. Gao and G.B. Gu	103
Omni-Vision System of Intelligent Car Based on DSP & FPGA Y.B. Zhou and Y.N. Yang	109

Finite-Time Chaos Control and Synchronization of the New Chaotic System with Unknown Parameters K.E. Li and Y.H. Xu	115
Chaotic Analysis of the Velocity Signal in Impinging Stream Mixer J.W. Zhang and Y.F. Song	122
Modeling and Experiment on Active Vibration Control of Hydraulic Excitation System H.X. Zhang and L.X. Miao	130
The Study of Ball and Plate System Based on Non-Linear PID S.Q. Sun and L. Li	134
Finite Element Analysis of the Static/Dynamic Behavior of Wind Turbine Gearbox W. Jing, X.J. Sun, W. Sun and A.G. Guo	138
Design of Auto Route Identified Vehicle Model Based on MC9S12XS128 F. Zheng	146
Finite Element Analysis of Flextensional Transducer with Slotted Shell S. Chen and Y. Lan	151

Chapter 4: Vibrational Analysis and Mechanics of Structures etc.

Experimental Study on Bending Capacity of Plain Wall System H.M. Yee, R. Rohim and O. Chong Yong	157
Gear Vibration Monitoring System Based on Virtual Instruments C.H. Wu, Y. Guo and Y.J. Fan	161
Design and Dynamic Walking Control of Humanoid Robot SCUT-I S. Bi, Z.J. Zhuang, H.Q. Min and H.X. Mo	165
Maximum Bending Moment and Maximum Additional Bending Moment for High Vertical Vessels under Wind Pressure J. Tian and Z.N. Zhang	173
Experimental Research on Trajectory Control of Walking Rehabilitation Training Robot Z. Wen, J.W. Qian, L.Y. Shen and Y.N. Zhang	177
Kinematics Simulation and Control System Design of Serial Robot Based on ADAMS and Pro/E H.M. Fan	186
Design of an Adaptive Terminal Dynamic Sliding Mode Controller for Anti-Ship Missiles P.C. He, L.S. Jia, Y.L. Wang and W.G. Zhang	190
Seismic Analysis for the Suspended Converter Valve Tower of the UHV Q.G. Sun, X.F. Wu, J.J. Di and Y.C. Zhou	196

Chapter 5: Materials Science and Technologies

Electronic Structures of X Level due to Indium-Carbon Dimers in Silicon H. Kawanishi and Y. Hayafuji	205
Improvement of Corrosion Resistance of Rare Earth Element (REE)-Based Anodic Oxidation Coating on AZ91D Magnesium Alloy M.Z.M. Zain, S. Illias, M.M. Salleh, K.A. Ismail and Z. Nooraizdiza	210
Enhancement of Mica Paper Insulation Strength with Surface Modification X.W. Zhang, S.P. Liu, Y.P. Qian and Y.B. Zhu	215
Index Loss Analysis of YBCO Coated-Conductor Coils by Means of Simulation X. Li, Y.S. Wang and Y.R. Zhang	220
The Synthesize and Properties of Aquosity Polyester Acrylate Nanoemulsion C. Yan, C.Z. Ma, G.C. Zhang and F.J. Qi	227
A Novel Anti-Fuse Based on (Ba, Sr)TiO₃(BST) and Pb(Zr, Ti)O₃ (PZT) Thin Films Q.Y. Tang, Y. Liu, Y.F. He, P. Li, X.D. Xie and G. Wang	231
Fiber-Optic Electric Field Sensor Based on Electrostriction Effect J. Zhao, H.Y. Zhang, Y.S. Wang and H.W. Liu	235
Life Prediction for Silicon Pressure Sensor Based on SVR Z.H. Zhai and P.L. Wu	241

Research on Ytterbium Doped Phosphate Glasses L.D. Fan and L.H. Wu	245
Synthesis of an Oxidation Resistant Coating for Ni-Based High Temperature Structural Materials by Dip Coating W.T. Chen, R.T. Wu, K. Chien, L.T. Wu, H. Gao and H. Harada	251
The Study of TiCN Coating Based on Vacuum Arc Ion Plating and its Performance L.J. Zou	255
A New Design of Underwater Robot Fish System Using Shape Memory Alloy P.H. Huang and J. Wang	260
Au Plating Failure Prevention on the Electronic Industry X.G. Liu, P. Liu, X.L. Gu and X.B. Zhao	267
Thermodynamic Evaluation and Assessment of the Ti-U Binary System Z.M. Cao, K.P. Wang, G.W. Du and Z.Y. Qiao	272

Chapter 6: Mechanical/ Automotive Systems and Allied Topics

Design and Implementation of SCM-Based Smart Cars M. Lin, Y.M. Zhang and L.G. Cui	281
Traction Control for a Fuel Cell Hybrid Vehicle (FCHV) W.J. Yang and Y.B. Kim	286
Kinematic Analysis of an Anthropomorphic Robot Hand P.K. Parida, B.B. Biswal and D.N. Thatoi	293
The Fuzzy Comprehensive Evaluation of Laser Weapon System Combat Effectiveness H. Li and L.H. Guo	298
Research on a Nonlinear Fuzzy Comprehensive Assessment Method for Oil & Gas Pipeline Failure Based on Fault Tree Analysis X. Wu, C.Y. Xiao and X.Y. Xu	304
Damping Force Analysis of Magnetorheological (MR) Dampers H.J. Xing	311
Numerical Investigation of a Blade Riblet Surface for Drag Reduction Applications with Large Eddy Simulation Method N.H. Wu, Y.H. Tang, C.B. Zhao, W. Lin, X.M. Chen and R.H. Li	315
The Design and Manufacture of the Intelligent Electric Cars for Firefighting Based on SCM M.L. Tang, L. He, H.Y. Wu, W. Wang and L.S. Cai	320
Investigation of the Temperature Distribution in the Lithium-Ion Battery for Pure Electric Vehicles L. Zheng, B. Wu and G.Q. Xu	324