

Contemporary Solutions in Applied Materials and Industry

Selected, peer reviewed papers from the 2013 2nd International Conference on Sport Material, Modelling and Simulation (ICSMMS 2013), January 20-21, 2013, Melbourne, Australia

von
Ming Wu, Andy Wu

1. Auflage

[Contemporary Solutions in Applied Materials and Industry – Wu / Wu](#)

schnell und portofrei erhältlich bei beck-shop.de DIE FACHBUCHHANDLUNG

Thematische Gliederung:

[Medizintechnik, Medizinische Werkstoffe](#)

Trans Tech Publications 2013

Verlag C.H. Beck im Internet:

www.beck.de

ISBN 978 3 03785 663 5

Table of Contents

Preface and Organizing Committee

Chapter 1: Research of Materials

Atomic Diffusion in the (001) Surface of Cu₃Ag Ordered Alloy Y.N. Wen	3
Atomic Simulation of Size Effect and Surface Properties of Aluminum Nanoparticles W. Zhu, W.L. Song and J.J. Wang	8
Research on Synthesizing Phenolic Resin of Foundry Binder System T.T. Hu and G.Q. Ren	15
Study on the Effect of Ultrasonic in the Mixing and Cooking of Sizing Material Y.H. Cui and Y.J. Liu	20
The Ageing Characteristics and Strengthening Mechanism of a Cu-2.1Ni-0.5Si-0.2Zr-0.05Cr Alloy Q.S. Wang, G.L. Xie, X.J. Mi, B.Q. Xiong and X.P. Xiao	25
The Effects of Sintering Temperature on the Properties of Mg-Mn-Zn Ferrites J.W. Fan, W.Q. Li, H.J. Zhao, X.L. Zhang and Z.G. Zhang	31
Study on the Silicone Coating with Heat Insulation and Resistance Z.S. Wang and Z.H. Zhen	35
The Prediction Model of the Mechanical Properties of Composite Materials Based on Ant Colony Neural Network J. Wang, J. Zhu and Q. Zhang	39
Quantitative Assessment the Physical-Mechanical Properties of Elastic Knitted Fabrics Y.R. Wang, P.H. Zhang and Y. Yao	44
Synthesis and Characterization of Fe²⁺-CTS/CA-CNTs Composite and its Magnetic Properties C. Yu, X. Zhang, K. He, Y. Liu and J.S. Qiu	49
Study on the Sewing Process of Automotive Seating Fabrics Y.H. Cui and L.Y. Jin	54
Experimental Researches Concerning the Manufacturing of Titanium Alloy TA6V Powders Used to Selective Laser Sintering I.D. Băilă and V.L. Lazăr	59
Extraordinary Properties and New Functions of Nanocomposite Gels and Soft Nanocomposites with Unique Organic/Inorganic Network Structures K. Haraguchi	65
Photoluminescence Properties of Cd Doped ZnO Films Obtained by PLD B.J. Zheng and W. Hu	70
The Effect of Sputtering Power on the Properties of Zr-Ga Co-Doped ZnO Films by DC Magnetron Sputtering X.L. Wu, H. Wang and Y.Z. Yuan	75
Liquid-Phase Method Preparation of Water-Soluble ZnS:Cu²⁺ Nanoparticles and Luminous Performance Research Y. Liang, Z.L. Wang, X.S. Zhang, L.J. Wei, C.Y. Li, Y. Li, Y.Z. Du and X.Y. Zhang	81
Health Risk Assessment of Six Heavy Metals in Different Sources of Honey Consumed in China J.Z. He, Q. Feng and P.L. Sun	86
Effects of Fly Ash on Heavy Metal Uptake of Rice Growing on Multi-Metal Contaminated Acidic Soil H.H. Gu, F.P. Li, X. Guan, Y.L. Xu, Y.J. Liu, X.T. Chen, X.H. Wang and Z. Wang	94
Design and Controllable Synthesis of Starch-Derived Magnetic Carbon Spheres with Hierarchical Pore Structure C. Yu, M. Chen, X. Zhang, J.B. Duan and J.S. Qiu	100
Influence of Different Precursors on the Nitrogenation Temperature of Sm₂Fe₁₇ L.X. Zhao and G.Y. Meng	105

Determination of Weight Values for Assessment Indexes of Engineering Materials Based on Fuzzy Pairwise Comparison Method M. Li and Y.J. Ma	109
Analysis of Microstructures and XRD of a Gradient Boron Alloyed Composite Material G.L. Xie, Q.S. Wang, X.J. Mi, B.Q. Xiong, J.T. Han, J. Liu and Z.Y. Jiang	113
Computational Analysis of Woven Fabric Impact Based on Hybrid Element Analysis X. Jia, Z.X. Huang, X.D. Zu and X.H. Gu	119
Application Research of New Type Fiber in Sports Equipments Y. Jing and G. Ming	124

Chapter 2: Biochemistry

Molecular Dynamics Optimization of a Computational Model of TACE and its Substrate Peptide S. Liu and X.H. Ma	131
A Highly Sensitive Resonance Rayleigh Scattering Method for Platelet-Derived Growth Factor Using Aptamer-Nanogold Probe as Catalyst of the Cu₂O Particle Reaction D.M. Yao, G.Q. Wen, J.N. Tian, Z.L. Jiang and A.H. Liang	137
An Immunonanoparticle Resonance Rayleigh Scattering Spectral Probe for Rapid Assay of Human Chorionic Gonadotrophin Q.Y. Liu, G.Q. Wen, K. Li and A.H. Liang	141
Surface-Enhanced Resonance Raman Scattering Spectral Probe Based on Functional Nucleic Acid and Nanoparticle Q.Y. Liu, G.Q. Wen, F.G. Ye and A.H. Liang	145
Synthesis of Chitooligosaccharide-Selenium and its Antioxidant Activity <i>In Vitro</i> L.M. Jin, C. Zhuang, C.S. Quan, X.J. Zhao and S.D. Fan	149

Chapter 3: Construction

The Fuzzy Reliability Analysis for the Super Wide Box Girder of New Jiujiang Changjiang River Bridge Y. Rong, H.Y. Huang and X.Q. Ouyang	157
Seismic Response Analysis for Shallow Tunnel in Different Earthquake Intensity L. Lin, H. Chuan, Z. Jing and G. Ping	161
A Modified Davidenkov Model for Stiffness and Damping Characteristics of Saturated Clayey Soils due to Low-Amplitude Small-Strain Vibrations P.F. Jia and A.W. Yang	166
Finite Element Analyze on the CFRP Steel Reinforced Concrete Filled with Steel Tube Column under Biaxial Load B. Wang, P.J. Sun, X. Wang and Y.F. Xu	172
Study on the Effect of Porosity on the Reflection Coefficient and Wave Pressure on the Partially Perforated Plates X.F. Chen and M. Zhang	177
Dynamic Response of Local Indentation of Sandwich Constructions under Low-Velocity Impact Z.Y. Xie	183
Seismic Analysis on RC Frame Strengthened with CFRP Q. Liu, X.Q. Bai and H.L. Zhao	188
Characteristics of Earthquake Damage for High Core and Concrete-Faced Rock-Fill Dams by Shaking Table Tests L.J. Yuan, X.S. Liu, X.G. Wang and C. Dai	194
Model Test and Field Test of the Stability of Large Ultra-Deep Foundation X.Y. Jia, Y.Q. Zhu and B.L. Lin	200
Seismic Performance of Moment End-Plate Connections to CFT Column under Cyclic Loading I.S. Sheet and U. Gunasekaran	205
Performance of an Interior Beam-Column Joint with and without a Slab under Cyclic Load S.M. Ahmed and U. Gunasekaran	211

Analysis of Wave Loads on Pile-Group Foundation Y.M. Liu	217
A Comparative Study of Compressive Strength of High Strength Concrete by Replacement Ratio of Recycled Coarse Aggregate Y.T. Lee, S.H. Kim, S.H. Lee, S.K. Baek, Y.S. Cho and S.U. Hong	222
Estimation of Compressive Strength of High-Strength Concrete with Recycled Aggregate Using Ultrasonic Pulse Velocity Method Y.S. Cho, S.K. Baek, Y.T. Lee, S.H. Kim, J.H. Park and S.U. Hong	226
Flexural Behavior of High Strength Reinforced Concrete Beams by Replacement Ratio of Recycled Coarse Aggregate Y.T. Lee, S.H. Kim, J.H. Kim, S.K. Baek, Y.S. Cho and S.U. Hong	230
Experimental Study on Seismic Performance of the Reinforced Concrete Grid-Mesh Frame Wall J.L. Qiao, W.L. Tian, M.J. Zhou, F.L. Jiang and K. Zhao	234
The Experimental Study on Frost Resistance of Gravel Concrete X.L. Gai	239
Numerical Analysis of Frictional Resistance on Embedded Large-Diameter Cylinder J. Zhang and W.J. Yao	243
A Numerical Study on Block Shear Strength of Channel Four-Bolted Connections Fabricated with Austenitic Stainless Steel T.S. Kim, M.S. Kim, S.H. Kim and Y.T. Lee	247
Structural Behaviours and Curling Influence of Single Shear Cold-Formed Ferritic Stainless Steel Bolted Connections Fastened with Two Bolts T.S. Kim and G.B. Chae	252
Wooden Buildings by the Fire Damaged of Toxic Gases on Personnel Evacuation Influences C.S. Lin, C.C. Yu, T.C. Chen, S.C. Wang and L.Y. Shen	257

Chapter 4: Industrial Manufacturing

Study on the Coating of Lost Foam Casting for Steel Casting Z.M. Liu, Y. Liu and D.H. Liu	267
Setting Analyse of Cycle Time and Buffer Capacity of Car Shops Base on Simulation X. Jin, J. Su and C.H. Yang	271
Stigmergy in Scheduling Process of Holonic Manufacturing Systems M. Gorgoi, A. Gurau and S. Oae	275
Research on Modern Technology and Sports Innovation Mechanism M. Gou and J. Yang	284
The Research and Application of Utility Boiler Energy Efficiency Test System H.W. Zhang, S. Dong and F. Yang	289
The Development Technology Policy of Secondary Oil Recovery in the Overpressure Carbonate Reservoir Y.F. Chen, Z.F. Fan, J. Ni, Y.J. Li and Q.Y. Hou	295
Application Research of Numerical Simulation in Physical Modeling Displacement Experiments J.W. Gu, W. Lu and J.P. Zheng	301
Water Locking Mechanics Characteristics and Countermeasures of Low Permeability Gas Reservoir C.M. Xu, X.H. Wang and F.Y. Guo	307
A High Density Fracturing Fluid System for HPHT Reservoir Stimulation Treatment P.L. Liu, Q. Zhu and X.J. Xing	312

Chapter 5: Mechanical Engineering

The Doubly Fed Wind Power Generator Output Characteristic with the Asymmetrical Grid Voltage H. Wang and L. Pan	317
---	-----

Hydrokinetic Analysis of Crankshaft Main Bearings in High-Speed Gasoline Engine X.J. Yu, J. Yang, Y.S. Wang and K. Li	322
Temperature Field Analysis of High-Speed Gasoline Engine Cylinder Head Based on Fluid-Solid Coupling Y.S. Wang, J. Yang, X.J. Yu and K. Li	327
Quality Detection of Soybean Oil with Voltammetric Electronic Tongue H. Men, C.W. Zhang, Y.P. Zhang and H.H. Gao	333
Comparison of Infrared Image Pre-Processing Technique on Electronic Power Equipment H. Men, X. Su, P. Chen and J.X. Yu	339
3D MRO Job Card Publishing Method for Aircraft J.H. Geng, X.T. Tian and X.W. Liu	345
Research on the Reasonable Air Velocity of Blast Furnace Tuyere X.P. Guo and W.Y. Han	351
Study on Paper Electromagnetic Drying Rate Z.S. Wang and Z.H. Zhen	356
A Study on Heat Generation Control of a Precision Ball Screw Drive System Z.Z. Xu, X.J. Liu, I.B. Lee, I.S. Ahn and S.K. Lyu	360
Fatigue Life Analysis of Lifting Mechanism Rod Based on Virtual Prototyping and FEM X.K. Ge, D.W. Liu and L.L. Zhu	364
Comparsion of Machining Stability of Up and Down Milling T.C. Hsiao and J.J.J. Wang	369
Design and Simulation for Key Components of Robotic Flower-Seedling Transplanter X. Wang and Q.C. Feng	387
Elastic Rod Based Carpet Loop Pile Trajectory Simulation G.F. Chen, Q.Q. Huang, L.L. Zhai and Q.Q. Li	392
UG Simulation Design of Electromagnetic Dryer Z.S. Wang and Z.H. Zhen	398
Heat Insulation Silicone Coating ANSYS Simulation Analysis Z.S. Wang and Z.H. Zhen	402
Simulation about Panel Edge Light Leakage R. Tang, J.K. Lv, Q. Zhang, B. Zou, D. Wang and X.B. Shao	406
3D Dynamic Finite Element Simulation Analysis of Single Abrasive Grain during Profile Grinding with Axial Feed J.M. Wang, F.Y. Tong and X.X. Li	410
Numerical Simulation of the Turbulent Flow in Ultra-Precision Aerostatic Bearings J.C. Zhu, H. Chen and X.D. Chen	417
Simulation Study of Heavy Vehicle Road-Friendliness under Bilateral Tracks' Excitation D.W. Liu, R.C. Jiang, Y.D. Yang and S. Wang	422
Numerical Simulation Study on the Hydrodynamic Performance of Two Blades of Canoes W.T. Zheng, D.Y. Zhang and G.X. Ye	429
Development of Canoe Equipments for Strength Training in Rowing Tank G. Xiao and W.T. Zheng	435
Study on Friction Characteristics According to Drawing Variables in Press Drawing Process Y.M. Heo, J.D. Kim and Y.J. Jeon	440

Chapter 6: Mechatronics, Control and Information Technology

Parallel Driving for the Design of Humanoid Robot G. Tang, J.H. Huang, G.F. Wei, G. Wu and H.S. Wang	449
A Multipath Cancellation Method Based on TK Operator for BOC Signals Z.L. Deng, L. Yang, L. Yin and Y. Xi	454
A Simplified Detection Method for PN Sequence Acquisition and its Performance Analysis Z.L. Deng, X. Yuan and Y. Zhang	460
Development of a Wearable Biofeedback Emotional Control Vest for Older Adult H.C. Lo, P.C. Lin and K.P. Lin	466

Trajectory Planning of Delta Robot for Dynamic Tracking, Pick and Placement G.F. Chen, L.L. Zhai, L. Li and J.W. Shi	473
Research on the Simulation of the Charge Mathematical Model of the Vehicle Starting Battery P.Y. Li and Y.T. Pan	479
Design and Application of the Wireless Grain Information Remote Monitor System C.F. Qiao, S.Y. Yin, L. Ling, R.J. Cheng, C.L. Xu and J. Wang	484
A Model Improvement of a Supercritical Unit Coordination Control System H.M. Niu, Z.X. Han, H.P. Huang and H.M. Zhang	488
The Application of Adaptive Kalman Filter in Traffic Flow Forecasting J.W. Gao, Z.W. Leng, B. Zhang, X. Liu and G.Q. Cai	495
A Study of Spinning Metering Pump Flow Rate Testing System C.J. Lu and Q. Gao	501
DFIG Virtual Inertia Frequency Control Strategy H. Wang and L. Pan	505
The Simulation of Retinal Inner Plexiform Layer Based on Parallel Algorithm Z.L. Wu and Z.J. Wang	509
Study on Numerical Simulation of a Fire on Heavy Oil Tank C.S. Lin, T.C. Chen, C.C. Yu, S.C. Wang and W.L. Chang	515
The Algorithm Based on the Discrete Fourier Transform of Eye Detecting and Locating S.W. Qu, Z.H. Guo and F. Wang	521
Applying Service-Oriented Composition Process in TPMS C.W. Yang, L. Wu, S.J. Liu and X.X. Meng	526
Modeling and Implementation of Inter-Campuses Equipment Optimized Management Based on WebGIS W.F. Ma	534
Research and Performance Analysis on Parallel Computing of Remote Sensing Image Based on MPICH J. Li and W.F. Ma	540
Application of Electronic Bills of Lading in International E-Commerce D.H. Liu and X.K. Xiao	546
Supply Chain Risk Evaluation Based on Bayesian Network B.C. Liu	550
Research on EC Security Problems and Countermeasures J.S. Hu	554
Introduce an Evolutionary Programming Model - A Simulation of the Evolution of DNA Code M. Fan and J. Ma	559
The Multi-Resolution Modeling of CTCS-3 Visualization Based on Meta-Model Y. Deng, R. Yang and Q.X. Zhou	565
Simulation of Bungee Jumping System and Open Experiment Teaching Using Simulink J.W. Yu, G.C. Wang, X.B. Jin and F. Wang	571

Chapter 7: Medicine and Medical Engineering

Garment Production Process Optimization Based on the Splicing of Knitting and Tatting Fabrics W.Z. Wang, X.N. Qian, Y.Z. Wang and D. Li	577
Outdoor Clothing Ecodesign Using Zipper as Functional Transformation Medium W.Z. Wang, B. Shao, L.Z. Wang, N. Wu and G.Y. Zhang	582
The Influence on Movement Comfort of Fabrics through Functional Finishing of Natural Dyes T.J. Yi, W.L. Wang, G.H. Chen and Y.J. Zhou	586
Wavelet Entropy Based Floating Thread Defect Detection for Tufted Carpet L.L. Zhai and G.F. Chen	591
Measure Energy Consumption Combined Heart Rate and Acceleration Z.Y. Li, X.B. Chen, R. Leng and F.B. Chang	597

The Study of Skeletal Muscle Weight Change on Female Elder Adults C.T. Yeh, S.C. Lin, H.T. Lin, H.C. Tsai and H.C. Cheng	602
Clinical Classification and Prognosis of Patients with Multiple Sclerosis in Northern China X.M. Han, Y. Chang, Z.S. Zheng and S.Y. Liu	606
Influences of Sufentanil Pretreatment on Ischemia-Reperfusion Injury in Rat Cardiac Apoptosis M. Gao, G.Q. Zhao, X.L. Li and D.P. Gao	611
Effects of Sufentanil Preconditioning on Myocardial Infarction Areas and the Myocardial Enzyme in Myocardial Ischemia- Reperfusion Injury in Rats <i>In Vivo</i> M. Gao, G.Q. Zhao, J. Wang and D.P. Gao	614
Effects of Morphine Postconditioning on Myocardial Ischemia-Reperfusion Injury in Rats <i>In Vivo</i> D.P. Gao, G.Q. Zhao, J. Wang and M. Gao	617
Epilepsia Partialis Continua Associated with Non-Ketotic Hyperglycaemia Y. Chang, Z.S. Zheng, H.H. Wang and S.Y. Liu	620
Web-Based Safety-Oriented Healthcare System Using Innovation Process for Patient Safety Y.J. Yang	624
Knowledge Management and Semantic Technology in the Health Care Revolution: Health 3.0 Model T.F. Chen, C.H. Ko and F.C. Cheng	633
Analyses of University Staff Members' Health Fitness - A Case Study on Asia University T.E. Lee, H.C. Wang and Y.T. Huang	639
Heart Sound Monitor for Bio-Signal Learning K. Tunlasakun	644
Calculation of Lumped Parameter of Two-Port Network for Volume Conduction Energy Delivery Z.D. Tang and X.F. Chen	649