

Table of Contents

Preface and Organizatin Committee

Chapter 1: Applied Materials Science and Related Industrial Technologies

Inhibition Mechanism of Crystal Crack in Copper Thick Plate He-GTA Welding by Adding Deoxidant Element Ti Y.N. Li, Z.L. Peng and S.B. Zhang	3
Eletroreduction of Fe₂O₃ to Fe in Strongly Alkaline Solution S.L. Gu, X.L. Zou and X.G. Lu	8
Preparation of Iodine Doped Titanium Dioxide to Degrade Aqueous Bisphenol A C.Y. Kuo, H.M. Hsiao and X.R. Lin	14
The MMT/MCNTs/sPEEK Nanocomposite Membrane for Proton Exchange Membrane Fuel Cells S.J. Lu, X. Liu, Z.Q. Cai, X.Y. Meng, Q. Zhou and L.S. Cui	19
Effect of Sintering Temperature Curve in Wick Manufactured for Loop Heat Pipe with Flat Evaporator S.C. Wu, K.C. Lo, J.R. Chen, C.Y. Chung, W.J. Lin and S.J. Su	24
Co-Producing Active Carbons and Sodium Silicate from Pyrolyzed Rice Husk by CO₂ Activation Coupled with NaOH Solution Boiling D.W. Li and X.F. Zhu	30
Cracking and Delamination Behavior of Gold Thin Strip Deposited on Polycarbonate Plate under Cyclic and Stepwisely-Increased Trapezoidal Tension Y.F. Hu, N. Tada and I. Shimizu	36
Study on Unsteady Deformation Law in Roughing Stage of Continuous Hot Strip Rolling X.P. Zhang, R. Ren and H.P. Kang	45
Stimulated Dissociation of Complex Ions and Structural Relaxation in Molten Non-Equilibrium MgCl₂ and ZnCl₂ O.M. Shabanov, S.I. Suleimanov, B.Y. Gyulov and A.O. Magomedova	51
Examination of the Electrolytic Polishing Metal Probe for the Cell Trap by an Electric Field Y. Sekido and K. Taguchi	56
Efficient PEGfusion Combinedoptical Tweezers and Dielectrophoresis Y. Mizuta and K. Taguchi	61
A Simplified Fabrication Method of Dielectrophoresis Chip Using Au Thin-Film and Box Cutter K. Nishimoto and K. Taguchi	65
Phenomenological Interpretation of Classical Expression for Force Affecting a Ferroparticle in the Magnetic Field A.A. Sandulyak, A. Sandulyak, V. Ershova, A. Snedkov and D.A. Sandulyak	70

Chapter 2: Mechanical Engineering

Research the Utilization Rate of Aluminum Alloy Material D.Y. Sun	79
Numerical Simulation of Piston Ring Lubrication with Multi-Grade Oil A.M. Salaheldin, Q. Zheng, X.Q. Lu, Y.B. Guo and J.Z. Zhu	83
Cutting Performance in Machining of Large-Sized Spiral Bevel Gears Using Multi-Axis Control and Multi-Tasking Machine Tool K. Kawasaki and I. Tsuji	91
Reconstruction Analysis of LH45 Type High Pressure Triplex Plunger Pump Shell C. Wang and J.J. Gao	98

Chapter 3: Applied and Computational Mechanics

Nonlinear Dynamic Response of a Thin Plate Embedded in a Fractional Viscoelastic Medium under Combinational Internal Resonances Y. Rossikhin and M. Shitikova	105
Dynamics Response of a Fractionally Damped Spherical Shell Impacted by a Body of Finite Dimensions T.K. Chang, Y. Rossikhin, M. Shitikova and C.K. Chao	111
Numerical and Experimental Study of Guided Waves Propagation in Composite Beam with Damage M. Barski and P. Pająk	117
3D Modeling of Wind Turbine Blade Based on SolidWorks W. Cong and S.P. Song	123
Performance Comparison of Rod-Baffle and Segment-Baffle Heat Exchangers Using Numerical Simulations Y.Z. Cao, L.J. Zhu and Y.H. Shi	128

Chapter 4: Materials and Technologies in Construction

On the Use of Vector-Valued Intensity Measure to Predict Peak and Cumulative Demands of Steel Frames under Narrow-Band Motions E. Bojórquez, A. Reyes-Salazar and S.E. Ruiz	137
Application of Two Different Methods for Determination of Water and Chloride Transport Parameters of Building Stones Z. Pavlík, J. Fořt, M. Pavlíková and R. Černý	143
Effect of Heating and Cooling Mode on Temperature and Enthalpy of Phase Changes in PCM Modified Plaster Z. Pavlík, O. Zmeskal, M. Pavlíková and R. Černý	149
Rebound Hammer Tests of Calcium Silicate Bricks – Effects of Internal Compressive Stress on Measurement Results J. Brožovský	155
Combination Rules and Maximum Response for Steel Buildings with PMRF Represented by Complex 3D MDOF Systems A. Reyes-Salazar, E. Bojorquez, F. Valenzuela-Beltran and J.I. Velazquez-Dimas	159
Ductility Reduction Factors for Steel Buildings Modeled as 2D and 3D Structures A. Reyes-Salazar, E. Bojorquez, A. Haldar, A. Lopez-Barraza and J.L. Rivera-Salas	166

Chapter 5: Control, Communication and Electronics

Research on Real-Time Monitoring of Coal Mine Trackless Rubber Tyre Electric Vehicle C.W. Zhang and M.Y. Wang	175
Development of a TriaxialMicro EDM Machine Tool Based on Programmable Multi-Axes Controller (PMAC) Z.L. Peng, D. Fang, Y.N. Li and Y.H. Liu	180
On-Line Monitoring Systems for Power Cable Junctions in City Zone T.Y. Li, J. Zhang and H.Y. Yao	185
Setting and Discriminant Method of Electronic Fence in Location Services J.N. Yang, J.K. Yang and G.R. Liu	191
Anti-ESD Improvement of a Power nLDMOS with a Perpendicular Super-Junction Construction in the Drain Side S.L. Chen and Y.S. Lai	195
A Novel Topology of Resonant Reset Two-Transistor Forward Power Converter G.Y. Xu, H. Yang, H.C. Zou and K.Y. Liu	201

Chapter 6: Measurements

Three-Dimensional Measurement of the Hydrocyclone Flow Field Using V3V J.G. Wang, H.L. Wang and X. Duan	209
Novel Measuring Method of Oxygen Content in $\text{La}_{2-x}\text{Sr}_x\text{CuO}_y$ Superconductors with the Dissolved Oxygen Sensor D. Zhang, S. Kambe, A. Tashiro, Y. Ohba, H. Mizuguchi, K. Ito, N. Kakizaki and Y. Okita	215
Design Optimization and Finite Element Analysis of 3C-SiC Bio-Sensors Based on Dogbone Resonator A. Iqbal, F. Mohd-Yasin and S. Dimitrijevic	221
Research on Non-Contact Three-Dimension Measure System Design of Artillery Parts Distortion W.L. Yu	228
The Research of Temperature Measuring System Based on Digital-Temperature Sensor G.J. Xu, J. Zhang, Z.Y. Yang and T.Y. Li	232
The Research on Fire Fighting System of Industrial and Civil Buildings Based on Network Video Q. Wang and W.P. Mu	237
A Novel Wireless Thermal Convection Type Inclinator by Using Non-Floating Structure J.M. Lin and C.H. Lin	243

Chapter 7: Biomedical Engineering

Application of Taguchi Method in the Optimization of Antioxidant Activity for Australian Tea Tree S.W. Wang, T.L. Su, J.Y. Ye and L. Lo	253
Comparison of Efficacy and Safety of Aripiprazole and Risperidone in the Treatment of Behavioral and Psychological Symptoms of Dementia K.Y. Luo and H.B. Fu	258
Predictive Models for Pre-Operative Diagnosis of Rotator Cuff Tear: A Comparison Study of Two Methods between Logistic Regression and Artificial Neural Network C.C. Lin, H.H. Chan, C.Y. Huang and N.S. Yang	263
Alpha Wave Attention EEG Analysis Based on the Multiscale Jensen-Shannon Divergence Z.X. Zhang, S.Q. Xu, E.N. Zhou, X.L. Huang and J. Wang	269

Chapter 8: Computational Mathematics and Mathematical Modeling

Continuously Harvesting of a Phytoplankton-Zooplankton System with Holling I Functional Response H.T. Sun and Y. Tian	277
Global Stability of a Non-Smooth Predator–Prey System with Holling I Functional Response and Refuge Effect Y. Tian, H.T. Sun and Y.X. He	283
Robust Edge Detection Based on Anisotropic Mathematical Morphology and Scale Multiplication in NSCT Domain Y.M. Dai and Y.Q. Wu	289
Coupling Analysis of Beta Rhythm Electroencephalogram Based on the Multiscale Mutual Mode Entropy N. Ji, J. Tan, A.S. Pei, J.F. Dai and J. Wang	295