

Table of Contents

Preface

Chapter 1: Materials Science

Phase Field Simulation of the Pure Material Dendrite Growth in a Forced Flow J. Liu and Y.S. Wang	3
Thermal Conductivity of SOI LDMOS Device Y. Xiong and Y.S. Lai	8
Study on All Solid-State Composite Polymer Electrolyte W.M. Wang	13
Preparation and Characterization of Composite Polymer Electrolyte W.M. Wang	17
Discussion on the Effect Factors of the Conductivity Performance of PEO-Based Polymer Electrolyte W.M. Wang	22
Electrochemical Properties of Nitrogen-Enriched Templated Microporous Carbons in Different Aqueous Electrolytes X.N. Tian, L.L. Zhang, Z.Q. Jiang and L.J. Luo	27
Performance of Ceramic Coating of MB3 Magnesium Alloy by Micro-Arc Oxidation S.Q. Zheng, L.P. Zhu, G.R. Chang, C. Lu and X.J. Li	38
Preparation of Nanometer ZnO Compound Particles and Ultraviolet Absorption Properties Y. Jia, X.Y. Wang, T.T. Liu and G.G. Xu	43
Hydrogen Chemisorption on Co(0001) Surface: A DFT Study X.F. Shang, Y.W. Wang, X.M. Tao and M.Q. Tan	48
Biological Multilayer Films Assembled by Redox Polymer and HRP on Screen-Printed Carbon Electrode Y.F. Sha, M. Zhao, M.Q. Yang, H.X. Bai and M. Zhao	56
Preparation and Characterization of Cu-Cr Alloy Powders P. Xiao, X.Y. Zhang and H.W. Lu	60
Study on Enhancement of Convective Heat Transfer in Nanofluids L. Zhang	65
Durability of Wood-Polymer Composite Prepared by <i>In Situ</i> Polymerization of Functional Monomers D.W. Gong, Z.B. Liu, H.W. Huang, C.Q. Zhang and C. Liang	69
Performance Research on Aniline Adsorption from Aqueous Solution by Modified Zeolite/EPDM Composite X.Q. Liu, H.Q. Xing, H. Chen and J.T. Liu	73
Microstructure and Behavior of Laser Cladding SiC + Ni-WC Ceramic Coating on H13 Steel Q.H. Yang, S.J. Shen and L.X. Wang	77
Theoretical Investigation of Energy Splitting of γ-LiAlO₂: Co³⁺ Ceramic Y. Huang, F. Miao and J. Ma	81
The Mechanical Properties that Nano-SiO₂ Affect EPS Light-Aggregate Concrete J. Cui	86
The Structural Design of Combined Absorber Composed by MPP and Multi-Layer Porous Material Based on VA One X.H. Duan, H.Q. Wang, W.J. Sun, D.Y. Kong and Z. Zhao	91
Study on Morphologies of Palladium Coated Foam Nickel Cathodes for Dechlorination of 2,4-Dichlorophenol J.J. Li, H.L. Liu, Z.W. Wang and X.W. Cheng	97

Chapter 2: Opto-Electronics Engineering

Angular Distribution of High Harmonic Generation in Aligned CO₂ Molecules P.H. Rao, B.L. Huang, J.J. Wu, H. Hu and P.F. Wei	105
Random Lasing Emission Form Granular-Surface PS/PMMA Blend Films X.K. Zhao	110
Analysis on the Scattering Characteristics of Two Stray Light Removing Metal Surfaces J.J. Chen, Z. Ma, X.T. Duan, Q. Liu, J. Han and X. Fu	115
Inorganic-Organic Hybrid Nanocomposites for Photovoltaic Applications L.M. Zhang	120
Influence of Electron Irradiation on the Yellow Luminescence in Undoped n-GaN L.M. Liang, X.J. Xie, Q.Y. Hao, Y. Tian, W.Z. Sun and C.C. Liu	125
Solvothermal Method Preparation of Nano Y₂O₂S:Eu³⁺ and Research of Luminescence Property L. Lu and Z.L. Wang	129
The Investigation of Metamaterials by Measuring the Power of Transmission in the Terahertz Regime J. Luo, Y. Chen, S.W. Kang, X.Y. Zhang, C.S. Xie and T.X. Zhang	133
Study on TE₀₁₁ Mode's Resonant Characteristic of Complicated Microwave Cavity with Ceramics Layer in Rubidium Frequency Standard X.X. Li and B.Z. Cao	137
Chemical Etching of Dislocations Process on Sapphire X.J. Xie, Q.Y. Hao, L.M. Liang, Y.Y. Li and C.C. Liu	143
GaN Layer Grown by Hydride Vapor Phase Epitaxy: Influence of the Reactor Pressure X.J. Xie, Q.Y. Hao, L.M. Liang, Y.Y. Li and C.C. Liu	147
Terahertz Response of Metamaterial Split-Ring Resonators: Numerical Analysis and Topology Design W.K. Xu and W. Wang	151
Near-Infrared Detecting Array for High Energy Laser Beam Diagnostics L. Zhang, Z.B. Wang, B.B. Shao, P.L. Yang and M.M. Tao	156
Influence of Plasmonic Light-Scattering by Gold Nano-Island Structures on the Quantum Efficiency of Organic Solar Cells B.Z. Wang, X.P. Zhang and J. Zhang	160
Directly-Written Metallic Photonic Crystals for Sensor Applications J. Zhang, X.P. Zhang, Z.G. Pang and B.Z. Wang	165
Forbidden Band Broadening of Photonic Crystal for Wide Waveband Infrared Stealth J.G. Zhao, X.K. Zhao, L.F. Wang and X. Zuo	170
Simulation of Flat-Top Focus Shaping Using Effect of Polarization in High Numerical Apertures Optical Systems K. Feng, J.S. Li and L. Guo	175
40 Gb/s Optical 3R-Regeneration Based on XPM and SPM in PCF S.X. Xu, L. Zhou and J. Xiao	180
Suppression of Double Rayleigh Scattering Induced Coherent Noise in a Remote Fiber Sensor System Using PGC Technique C.Y. Cao, S.D. Xiong, Z.L. Hu and Y.M. Hu	185
Study on Experimental Preparation of SS-O Solar Spectrum Selective Absorbing Coating H.W. Liu and K. Wu	190
Generation of Multi-Atom W States in Microtoroidal Cavity-Atom System Y.T. Huang, L. Ou and Y. Huang	195
Research of the Technology Based on Fiber Bragg Grating for Measurement of Temperature Rise of Electrical Appliances Z.X. Wu, Y.Z. Wei, J. Cui, S.S. Wang and X.P. Dong	200
The Effects of Pump Beam on Cesium Magnetometer Sensitivity Q.M. Li, J.H. Zhang, Q. Liu, Z.J. Huang and W.M. Sun	205
Influence of Pump Light's Duty Cycle on Cesium Atomic Magnetometer X.J. Zeng, J.H. Zhang, Q. Liu, Z.J. Huang and W.M. Sun	209
Performances of Non-Line-of-Sight Ultraviolet Multi-Scatter Propagation for Noncoplanar Geometries Y.N. Tang, X.P. Xie and W. Zhao	214

A Study of Automatic Calibration in Dual Linear-CCD Camera Intersection Measuring System	
X. Chen and J.Y. Tang	219
Study on Ameliorating the SCG-LDPC Code for High-Speed Optical Communication Systems	
J.G. Yuan, Q.Z. Tong and L. Xu	224
Noise Analysis of EMCCD and Optimum Design of its Operating Mode	
Y.G. Zhang, T. Li and Z.K. He	229
Measurement of SO₂ Using Differential Optical Absorption Spectroscopy Based Fourier Transform Filtering	
H.M. Zheng, Z.L. Dong, D.S. Xie and X.X. Shang	234
Electronic and Optical Properties of RB₆ (R=La, Nd): A Computer Aided Design	
P. Qin, C. Xu and D. Chen	239
Measurement and Analysis of near Infrared Spectrum of Gasoline Vapor	
L.P. Yan, S. Li, L.G. Luo, M. Zhang and J.X. Dong	243
Research on Satellite Platform Vibration Compensation Technology for Space Optical Communication	
C.S. Han and X.Z. Li	248
Optimization of Trapezoid Coupling Grating for Long-Wave Quantum Well Infrared Photodetector	
R. Wang, Y.L. Yang, G.D. Wang and Y.Y. Liu	252
Optimization of Xenon Gas Discharge Flat Panel Lamps	
K. Wang, J. Li and S.Q. Wang	256
A 5-Port Photonic Lantern for Light Beam Combining	
Q. Yan, H.J. Yu, F.J. Tian and W.M. Sun	261
MOCVD Growth and Optical Properties of Self-Assembled InAs/GaAs Quantum Dots	
P. Tian, C.Q. Huang, W.H. Luo and J. Liu	265
The Impact of Cap Layers on the Structural and Optical Properties of Self-Assembled InAs/GaAs Quantum Dots	
P. Tian, C.Q. Huang, W.H. Luo and J. Liu	269
Research of a Small-Scale Building Integrated Photovoltaic Micro-Grid System	
C.F. Lv, A.G. Wu, H. Zhang and F. Han	273
Investigation on Dispersion Property of a Novel Photonic Crystal Fiber with Square Array Air Holes	
Y.J. Liu and T. Dai	278
Fisher Information and Quantum Squeezing Properties of Gaussian Pure States	
J.Q. Zhao, L.Z. Cao and H.X. Lu	283
Dynamically Manipulating Beam with Metallic Nano-Optic Lens Containing Liquid Crystal	
J.C. Wang, X. Zhou, J. Gao, Z.T. Xu, L. Sun and X. Jin	287
Optical Properties of LaB₆: A Computer Aided Simulation	
B.H. Yu, C. Xu and D. Chen	292
Study on All-Optical Slow-Light Delays of Stimulated Brillouin Scattering in Photonic Crystal Fibers	
C.L. Hu, S.L. Hou, Q. Kong, Y.J. Liu and Y.Z. Xu	296
Characteristic of Point Defect around the Photonic Crystal Bend	
R.C. Lu, C.M. Wang and K.Y. Lee	300
Precision Focal Measuring System Based on CCD Aerial Cameras	
M. Zhao, Y.F. Sha, F. Guo and M.Q. Yang	304
A Measuring System of Focus Surface Message to Aerial Cameras Using CCD Camera	
M. Zhao, F. Guo, Y.F. Sha and M.Q. Yang	308
An Automatic Examining-Focus System to Aerial Cameras with CCD	
M. Zhao, M.Q. Yang, F. Guo and Y.F. Sha	312
Phase-Only Beam Optimization for GaAs Optical Waveguide Phase Array	
Y. Zhang, J.J. Xue, Z.S. Wu and Y.S. Zhang	316
The Deformation Measurement Technology Based on Differential Fiber Interferometer with PCI Data Acquisition System	
H.E. Luo, J.L. Gu, P. Chen and Y. Xia	320

Design of Compact Infrared Zoom Lens System A. Yan, D.S. Wu, H. Wang, J.Z. Cao, J.J. Ma, J.F. Yang, Z.F. Zhou, L. Wu, J. Zhang and Z. Zhang	324
The Bandpass Chebyshev Microwave Photonic Filter Designwith Digital Filter Methods X. Wang, K.Y. Nie, X.D. Liang and M. Li	328
Simulation of Laser Beam Scattering from Complex Targets in the near Field J.X. Lin, Z.S. Wu, X. Su and B. Wang	332
Study of Aperture-Averaged Scintillation for a Partially Coherent Gaussian Schell-Model Beam Propagation in Slant Atmospheric Turbulence Y.Q. Li, Z.S. Wu, Y.Y. Zhang and H.L. Zhang	337
The Building of Optical Fiber Network System Using Hetero-Core Fiber Optic Sensors Y. Han	342
The Three-Dimensional Analysis of Light Scattering Characters for Rayleigh Particles On/Below the Wafer L. Gong, Z.S. Wu and Y.Q. Li	347
Design of a Cryogenic Terahertz Fourier Transform Spectrometer X.X. Li, X.Y. Zhang, H. Qin and B.S. Zhang	352
Scattering Properties of the Higher-Order Hermite Gaussian Beam T. Qu, Z.S. Wu, H.Y. Li and Z.J. Li	357
Terahertz Filter Based on Frequency Selective Surfaces X.Y. Zhang, Z.X. Zheng, X.X. Li, R.B. Tan, Z.P. Zhang, Y. Zhou, J.D. Sun, B.S. Zhang and H. Qin	362
Scattering Characteristics of Complex Target from Solar Irradiance and Sky-Ground Background Radiance in Infrared Spectrum X. Guo, Z.S. Wu, L.X. Ling Hu and Y.F. Yang	367
Scattering of Two-Dimensional Sea Surface at Low Grazing Angles with Physical Optics Method Z. Chen, Z.S. Wu, Y. Zhang, J.J. Xue and W.H. Ye	372
Real-Time Opto-Electronic Hybrid Joint-Transform-Correlator for Scene Matching Guidance X.K. Zhao and Q.W. Zhao	377
Adaptive Interleaving Method and its Application to Free Space Optical Communications through Atmospheric Turbulence Channel Z.H. Yang, Q.W. Ran, J. Ma, L.Y. Tan, S.C. Wu, Q.F. Liu and H.X. Liao	382
Study on Optical Performance Monitoring for Fiber-Optical Link Utilizing Chaos Theory Q.Q. Fan, H. Li and H.X. Yin	390
Effects of Core Diameter Variation on the Silicon Photonic Nanowire Soliton Effect Compressor J.Y. He, W.J. Meng and C.J. Zhao	395
Analysis on the Relationship between Burst Errors and Tracking Control Frequency in Satellite-to-Ground Laser Communications Q.W. Ran, Z.H. Yang, J. Ma, L.Y. Tan, S.C. Wu, Q.F. Liu and H.X. Liao	400
The Imaging Optical Setup in the Spectral Radiance Facility Z.F. Wu, C.H. Dai, B. Huang, J.L. Yu and H.Q. Ouyang	406
Research on the Speed Optimization of Laser Marking Q.W. Yu, D.Y. Wang and J. Yu	411
Path Loss of Non-Line-of-Sight Single-Scatter Model T.R. Wang, L. Bai and Z.S. Wu	416
Application of Real-Time Wavelet Threshold Filtering in FOG Attitude Measurement System X.Q. Tang, X.W. Cheng, H. Zhang and X.Y. Huang	421
Study of Top Triangular Nano-Grating on Solar Cell Using Rigorous Coupled Wave Analysis X.M. Jin, D.A. Cattarusa and M.J. Marshall	427
Sphere-Based Geometrical Calibration Method for Structured Light Surface Measurement Systems J. Douet, J. Xu and K. Chen	433

Experimental Study on the Imaging of the Squeezed State Light with -4.93dB Quantum-Noise Reduction at 1064 nm B.Z. Lu, S.W. Bi, F. Feng, M.H. Kang and F. Qin	439
A Three-Channels WDN Based on Multimode Interference Photonic Crystal J.H. Yan	445
Methods of Determining Optimal Fitting Spherical Surface for Off-Axis Aspheric Optics Finishing X.Z. Xu, Z. Yun, Y.W. Yu and J.F. Zhi	450
Wavelength Division Multiplexing between 2.5-Gbits/s Chaotic Optical Secure Channel and 10-Gbits/s Nonchaotic Fiber-Optic Channel X.L. Chen, Q.C. Zhao, H.X. Yin and X.Y. Dou	457
The Design and Experimental Study of the Laser with Peak Power G. Li, L. Li, H.B. Shen, W.S. Hua, S.J. Mao and Y.B. Wang	462
Laser Linewidth Measurements Using Self-Heterodyne Detection with Total-Reflected Delay Line J. Li, N. Xu, J.W. Li and Z.X. Zhang	467
Ultrafast Electrical Signal Electro-Optic Sampling Test Theory and Test System J.W. Li, N. Xu, J. Li and Z.X. Zhang	471
Optical-Mode Study of Gallium Nitrate Based Laser Diodes D.A. Cattarusa, X.M. Jin, X.X. Fu, X.N. Kang, B. Zhang and G.Y. Zhang	476
Research of Optical Fiber Degree of Polarization (DOP) Measurement N. Xu, J.W. Li, J. Li and Z.X. Zhang	482
An Improved CSO Resolution Method for IR Sensor Based on Pixel-Cluster Decomposition H. Zhang, H. Xu and Y. Xu	486
Experimental Investigation of Terahertz Temporal Response of a Photoconductive Switch P.W. Gong, Z. Ma, H.M. Ma and C.T. Yang	491
A Simple Mechanism to Suppress the Mode Competition for Stable and Tunable Dual-Wavelength Erbium-Doped Fiber Lasers C.F. Zhang, J. Sun, S.W. Zheng and S.S. Jian	496
Frame and Frequency Synchronization for MIMO OFDM Using Symmetric and Repeat Training Sequence M.X. Liao, Z.F. Tan and J. Liu	500
A Non-Destructive Method Based on QPSO-RBF for the Measurement of Sugar Content in Cantaloupe L.L. Gao, Z.H. Jia, X.Z. Qin, X.H. Huang and Y.B. Yao	505
A Novel System Strategy in CDMA Service Simulation and Air Interface Signaling Gathering Z. Wan, J.H. Shen and L.B. Jiao	510
A SoC for Intelligent Control Systems Z.X. Zheng, G.M. Tang and L.M. Liu	514
Adaptive Control of a Surface Ship at High Speed Using Neural Networks L.D. Guo and L.X. Yang	518
The Design of Interface for Actuating Mechanism and CAN Bus Based on PC/104 B. Xu, X.D. Xue, H.L. Wang and S.A. Zhang	524
Electromagnetically Induced Left-Handedness in a Dense Atomic Vapor Medium L.Q. Wang and X. Yan	529
The Design and Implementation of Parallel Distributed Algorithm FIR Filter Based on FPGA B.F. Zhang, D.H. Man and J.C. Zhu	534
A Biosensor for Sandwich Immunoassay by Electrodepositing Redox Polymer on Screen-Printed Carbon Electrode Y.F. Sha, M. Zhao, F. Guo, J. Xie and W. Han	538
Compression of Fault Data in Power System Based on Lifting Wavelet Transform J.F. Wang, P.Y. Liu, Y.L. Ma and L.Y. Xu	542
Simulation and Analysis of Stealth Fighter RCS in High-Frequency Band K. Wang, L. Cheng, X.Y. Wang and C.Y. Fu	547
Wavelet Analysis of PK2600 Measurement Data on Core-Rod H.S. Li and Z.Y. Li	551

Use Skill of External Memory Expansion for DSP of TMS320VC5409 L. Huang, X.Z. Li, Q.L. Zhao and C.S. Han	555
Full-Order Filters and Smoothers for Descriptor Systems with Delayed Measurements J.H. Zhan, J. Ma, J. Hao and J. Ding	559
Design and Experimental Study of Deposition Temperature Control System in Ultra-High Vacuum Z.D. Yan, L.D. Sun, C.G. Hu, X.T. Hu and P. Zeppenfeld	564
The Electric Field Tuning Characteristics in the Strain-Mediated Ferrite-Piezoelectric Laminated Magnetoelectric Microwave Devices H.M. Zhou, F. Li, J.H. Deng and J. Wei	569
Monte Carlo Model of Optomechanical Tolerance for Lens Assembly Q.H. Lin and Z.S. Da	574
Estimation of Dielectric Response Parameters of Transformers Using Hybrid Genetic Algorithm T. Zhang, D.H. Li, F.L. Ma and H.J. Ran	579
Research Progress of Wavelet Denoising Method of Transformer Partial Discharge Signal Y. Zhang and F.C. You	584
Applications of ARM-Based Remote Monitoring System for Large Scale Poultry Farm Y.Q. Lu	589
The Implementation of Instrumentation Systems of Fire Truck Simulator Based on PLC L.W. Wang, X. Chen and L.S. Jia	593
Simulation Analysis of Output Characteristic of the Inductive Displacement Transducer R.F. Song, L.M. Song and Q.M. Yang	600
Research on Design of Cable Wireless Temperature Monitoring System A.Q. Yu and H.S. Hu	604
A Fast Field Area Measurement Method Based on Global Positioning System L.L. Jiang, M.F. Luo and J.F. Yang	609
Generalized Block Triangular Preconditioner for Saddle Point Systems S.H. Cheng and L.T. Zhang	614
Research on the Three-Dimensional Velocity Field Splitting Measurement Method of Cavitations-Impinging Stream Reactor Q. Li, F.B. Li, Z.K. Li and D.X. Wang	618
Study on One Measurement Method of Earth Angle F.B. Li, Z.K. Li, Q. Li and D.X. Wang	622
Extraordinary Electromagnetic Scattering of Plane Wave by Double Negative Coated Sphere Y. Shi, Z.S. Wu, H.F. Tian and Z.J. Li	626
Study of Electromagnetic Scattering Characteristics from Typical Land Surface with Integral Equation Method Y.Y. Zhang, Z.S. Wu, Y.Q. Li and H.L. Zhang	631
A Bayesian Game Analysis of Byzantine Attacks for Wireless Cognitive Sensor Networks in Smart Grids W.M. Lang, Y.C. Zhu and H.S. Li	636
Role of Molecular Alignment Distribution in High Harmonic Generation B.L. Huang, J.J. Wu, P.F. Wei and X.H. Huang	641
An Improved Frame Synchronization for Optical OFDM Systems M. Liang, R. Lu, Y.B. Wang and J.M. Gong	646
A Novel Multipriority Reservation Protocols for Optical Fiber Network Y. Zhang	651
Wavelength Division Multiplexer Based on Periodic Dielectric Waveguide Ring Resonator R.C. Lu, T.H. Chen and Y.P. Liao	657
A New Intelligent Color Scale Sensor Y.C. Yang, Q. Zhang and R.M. Pan	661
Pulse Sorting Algorithm Using TDOA in Multiple Sensors System S. Ma, Z. Liu and W.L. Jiang	665
Application with Wavelet Detection to Signal Process of SINS X.Y. Huang, X.Q. Tang, L.B. Guo and X.W. Cheng	671

Design of the Instrument of Measuring Moisture Ratio in Textile Fibre Based on Integrate Circuit CAV424 Q.Y. Xu and L.K. Yang	676
An Embedded Multimedia Player on S3C6410 Platform Y.H. Liu and S. Wang	680
Effect of Ionization Potential on Molecular Field-Free Alignment J.J. Wu, B.L. Huang, H. Hu and P.F. Wei	687
The Doppler Radar Bomb Chamber Volume Speed Measurement System Research Based on LabView N. Song, Y. Jiao, Y.J. Song and C.H. Liu	692
The Application of Frequency Response Analysis in Online Testing System of Transformer W. Zhou and B.B. Liu	696
Schlieren and PLIF Measurements of Liquid Fuel Injection in Mach 2 Supersonic Crossflow H. Yang, F. Li, B.G. Sun, D.D. Tian, Y.Y. Song, D.P. Guo and X.Z. Gao	701
Transmission and Receiver Double Smoothing for Multitarget Localization in MIMO Radar H.B. Li, Y. Wang and J. Gong	706
Fast Angle Estimation Based on MSWF and Polynomial Rooting for Monostatic MIMO Radar J. Gong, C.Y. Wang and H.B. Li	711
Research for Thermal Drift of APD Gain in Distributed Temperature Sensing System Based on the Raman Back-Scattering L. Sang, J. Zhang and X.Q. Wang	716
Miniature UWB Filter Using Three-Quarters Wavelength Resonator with Direct-Connected Feed Method C. Peng	721
Optimal Design of CCD Driving Signal Based on FLEX 10K Z.K. He, S.B. Wu and Y.G. Zhang	725