

Contents

Part I Material Science and Technology, Smart Materials

The Effective Optimal Parameters of Metamaterial on the Base of Omega-Elements	3
Igor V. Semchenko, Sergei A. Khakhomov, Andey L. Samofalov, Maxim A. Podalov and Qian Songsong	
Impact of Ion Nitriding on Phase Composition, Structure and Properties of Carbon Films Doped with Metals	11
A.S. Rudenkov, D.G. Piliptsov, A.V. Rogachev, N.N. Fedosenko and Xiaohong Jiang	
Effect of Shungite Nanocarbon Deposition on the Luminescent Properties of ZnS:Cu Particles	19
M.M. Sychov, S.V. Mjakin, K.A. Ogurtsov, N.N. Rozhkova, P.V. Matveychikova, V.V. Belyaev, F.I. Vysikailo and Y. Nakanishi	
Nano-Sized Calcium Phosphates: Synthesis Technique and Their Potential in Biomedicine	25
Linda Vecbiskena	
Frequency Resolution and Accuracy Improvement of a GaP CW THz Spectrometer	33
Tetsuo Sasaki, Tadao Tanabe and Jun-ichi Nishizawa	
Study on the Magnetizing Frequency Dependence of Magnetic Characteristics and Power Losses in the Ferromagnetic Materials	39
Maciej Kachniarz and Dorota Jackiewicz	
Synthesis and Study of Luminescent Materials on the Basis of Mixed Phosphates	47
Vitalii V. Malygin, Lev A. Lebedev, Vadim V. Bakhmetyev, Mariia V. Keskinova, Maxim M. Sychov, Sergey V. Mjakin and Yoichiro Nakanishi	

The Effect of Cutting Edge Sharpness on Cutting Characteristic of Polycarbonate	55
Yuki Kurita, Katsuhiko Sakai and Hiroo Shizuka	
Investigation of the Magnetoelastic Villari Effect in Steel Truss	63
Dorota Jackiewicz, Maciej Kachniarz and Adam Bieńkowski	
Atomic Force Microscopy Study of Contamination Process of Glass Surface Exposed to Oleic Acid Vapors	71
F. Samoila, A. Besleaga and L. Sirghi	
Thin Film Formation of the Polyvinylpyrrolidone-Added Europium Tetrakis (Dibenzoylmethide)-Triethylammonium and Its Mechanoluminescent Properties	75
R.A.D.M. Ranashinghe, Masayuki Okuya, Masaru Shimomura and Kenji Murakami	
Part II Nanotechnology, Nanometrology, Nanoelectronics	
Toward Room Temperature Operation of Dopant Atom Transistors	83
Michiharu Tabe, Arup Samanta and Daniel Moraru	
EDMR on Recombination Process in Silicon MOSFETs at Room Temperature	89
Masahiro Hori and Yukinori Ono	
Inter-band Current Enhancement by Dopant-Atoms in Low-Dimensional <i>pn</i> Tunnel Diodes	95
Daniel Moraru, Manoharan Muruganathan, Le The Anh, Ratno Nuryadi, Hiroshi Mizuta and Michiharu Tabe	
Ferroelectric Properties of Nanostructured SBTN Sol-Gel Layers	103
V.V. Sidsky, A.V. Semchenko, S.A. Khakhomov, A.N. Morozovska, N.V. Morozovsky, V.V. Kolos, A.S. Turtsevich, A.N. Pyatlitski, Yu M. Pleskachevsky, S.V. Shil'ko and E.M. Petrokovets	
Scanning Nanopipette Probe Microscope for Nanofabrication Using Atmospheric Pressure Plasma Jet	109
Futoshi Iwata, Daisuke Morimatsu, Hiromitsu Sugimoto, Atsushi Nakamura, Akihisa Ogino and Masaaki Nagatsu	
Fabrication of 2D TiO₂ Nanopatterns by Plasma Colloidal Lithography	117
Alexandra Demeter, Alexandra Besleaga, Vasile Tiron and Lucel Sirghi	

Pulse-Driven, Photon-Coupled, Protein-Based Logic Circuits 123
Balázs Rakos

Nanosilica Suspensions for Monocrystalline Silicon Wafers CMP Surface for Micro- and Nanoelectronics 129
Yanina Kasianok, Vladimir Gaishun, Olga Tyulenikova and Sergey Khakhomov

Manipulation of Single Charges Using Dopant Atoms in Silicon—Interplay with Intervalley Phonon Emission 137
Yukinori Ono, Masahiro Hori, Gabriel P. Lansbergen and Akira Fujiwara

Doped Two-Dimensional Silicon Nanostructures as a Platform for Next-Generation Sensors 143
Roland Nowak, Krzysztof Tyszka and Ryszard Jablonski

Part III Biotechnology, Bioengineering, Environmental Engineering

Numerical Investigation of the Effect of Fluid Flow on Biofilm Formation in a Channel with Varying Cross-Section 151
Y. Okano, Y. Takagi, T. Ohata, Z.K. Sanchez and K. Kimbara

Decision Based Algorithm for Gene Markers Detection in the ISH Images 159
Tomasz Les, Tomasz Markiewicz, Marzena Jesiotr, Wojciech Kozłowski and Urszula Brzoskowska

A Study of the Influence of Plasma Particles for Transdermal Drug Delivery 167
Jaroslav Kristof, An Nhat Tran, Marius Gabriel Blajan and Kazuo Shimizu

Automatic Method for Vessel Detection in Virtual Slide Images of Placental Villi 175
Żaneta Swiderska-Chadaj, Tomasz Markiewicz, Robert Koktysz and Wojciech Kozłowski

A Novel Particle Classification Technique Arising from Acoustic-Cavitation-Oriented Bubbles (ACOBs) Under kHz-Band Ultrasonic Irradiation in Water 183
Sayuri Yanai and Takayuki Saito

Numerical Investigation of Drag Reduction by Hydrogel with Trapped Water Layer 189
Petya V. Stoyanova, Youhei Takagi and Yasunori Okano

Development of High-Frequency Acoustic Source for Auditory Stimulated Magnetoencephalography	197
Anna Jodko-Władzińska, Michał Władziński, Tadeusz Pałko and Tilmann Sander	
Dynamic Promotion and Suppression Model for Plasmid Conjugal Transfer Under a Flow Condition	203
T. Watanabe and K. Takeda	
Impedance Spectroscopy as a Method for the Measurement of Calibrated Glucose Solutions with Concentration Occurring in Human Blood	211
Izabela Osiecka, Tadeusz Pałko, Włodzimierz Łukasik, Dorota Pijanowska and Konrad Dudziński	
Physical Breast Model Design for Contact Thermography	217
Joanna Małyska, Michał Biernat, Włodzimierz Łukasik and Tadeusz Pałko	
Numerical Study of the PDMS Membrane Designed for New Chamber Stapes Prosthesis	223
Katarzyna Banasik and Monika Kwacz	
Part IV Plasma Physics	
Optical Fibre Probing for Bubble/Droplet Measurement, and Its Possibility of the Application to Biotechnology	231
Takayuki Saito	
Fluorescence Analysis of Micro-scale Surface Modification Using Ultrafine Capillary Atmospheric Pressure Plasma Jet for Biochip Fabrication	247
Masaaki Nagatsu, Masahiro Kinpara and Tomy Abuzairi	
Cleaning of Silica Surfaces by Surface Dielectric Barrier Discharge Plasma	255
Lucel Sirghi, Florentina Samoila and Viorel Anita	
Removal of Cs Ion from Aqueous Solution Using Prussian Blue-Carrying Magnetic Nanoparticles	261
Toshiya Takayanagi and Masaaki Nagatsu	
Low-Temperature Disinfection of Tea Powders Using Non-equilibrium Atmospheric Pressure Plasma	269
Syuhei Hamajima, Naohisa Kawamura and Masaaki Nagatsu	

Part V Measurement, Signal Processing, Identification, Control

E-vehicle Predictive Control for Range Extension	279
Pavel Steinbauer, Florent Pasteur, Jan Macek, Zbyněk Šika and Josef Husák	
Tilt Measurements in BMW Motorcycles	287
Sergiusz Łuczak	
Novel Measurement Method of Longitudinal Wave Velocity of Liquid Using a Surface Acoustic Wave Device.	295
Jun Kondoh and Michiyuki Yamada	
The Effective Method to Search the Optimal Experimental Conditions in a Micro Flow Reactor	301
M. Abe and K. Takeda	
Displacement Field Estimation for Echocardiography Strain Imaging Using B-Spline Based Elastic Image Registration—Synthetic Data Study.	309
Aleksandra Wilczewska, Szymon Cygan and Jakub Żmigrodzki	
Numerical Simulation of the Self-oscillating Vocal Folds in Interaction with Vocal Tract Shaped for Particular Czech Vowels.	317
Petr Hájek, Pavel Švancara, Jaromír Horáček and Jan G. Švec	
Distance Metric for Speech Commands of Dysarthric Users in Smart Home Systems	325
Gabriella Simon-Nagy and Annamária R. Várkonyi-Kóczy	
E-learning Environment for Control of Form Measuring Machines	331
Rafał Kłoda, Kacper Kurzejamski, Jan Piwiński and Konrad Parol	
Cathodoluminescent Properties and Particle Morphology of Eu-Doped Silicate Phosphors Synthesized in Microwave Furnace . . .	339
Igor A. Turkin, Mariia V. Keskinova, Maxim M. Sychov, Konstantin A. Ogurtsov, Kazuhiko Hara, Yoichiro Nakanishi and Olga A. Shilova	
Part VI Robotics, Computing, Modelling, Diagnostics	
Integration of Machine Learning and Optimization for Robot Learning	349
Amir Mosavi and Annamaria R. Varkonyi-Koczy	
Application of Model Reference Control for MIMO System	357
Jerzy E. Kurek	

IT System Supporting the Security System in Plants Posing a Risk of a Major Industrial Accident.	363
Michał Syfert, Bartłomiej Fajdek and Jan Maciej Kościelny	
Natural Frequencies and Multi-objective Optimization of the Model of Medical Robot with Serial Kinematical Chain.	371
Grzegorz Ilewicz	
Effective Testing of Precision of a Motion of the Tool Center Point of the KUKA Industrial Welding Robot in Its Various Operating Modes.	379
Igor Košťál	
Modified Flow Rate Algorithm for Leak Detection in Transient State from a Liquid Pipeline's Operating Point Change	387
Paweł Ostapkowicz, Mateusz Turkowski and Andrzej Bratek	
Modular Multidisciplinary Models for Prototyping Energy Harvesting Products	395
Jan Smilek, Ludek Janak and Zdenek Hadas	
A Multi-attribute Classification Method to Solve the Problem of Dimensionality	403
A.R. Várkonyi-Kóczy, B. Tusor and J.T. Tóth	
Performance Enhancement of Fuzzy Logic Controller Using Robust Fixed Point Transformation	411
Adrienn Dineva, Annamária Várkonyi-Kóczy, József K. Tar and Vincenzo Piuri	
Hip Articulation in Orthotic Robot	419
Marcin Zaczek, Dymitr Osiński and Danuta Jasińska-Choromańska	
Application of Artificial Neural Networks for Early Detection of Breast Cancer	425
Krzysztof Urbaniak and Krzysztof Lewenstein	
New Ways of Selection of Vibroacoustic Isolation Selection for Utilization in Checkweighing Systems	435
Paweł Nowak, Marcin Kamiński and Roman Szewczyk	
Thermoanemometric Flowmeter of Biofuels for Motor Transport	443
Igor Korobiichuk, Olena Bezvesilna, Andrii Ilchenko and Yuri Trostenyuk	
Research on Automatic Controllers for Plants with Significant Delay.	449
Igor Korobiichuk, Dmytro Siumachenko, Yaroslav Smityuh and Dmytro Shumyhai	

Early Support of Technical Education 459
 Jaromir Hrad, Tomas Zeman, Boris Simak, Daniela Spiesova
 and Dusan Maga

Part VII Metrology, Sensors and Devices

**Uncertainty Analysis as the Tool to Assess the Quality
 of Leak Detection and Localization Systems** 469
 Mateusz Turkowski, Andrzej Bratek and Paweł Ostapkowicz

**Development of a Microfluidic Device System Using Adhesive
 Vinyl Template to Produce Calcium Alginate Microbeads
 for Microencapsulation of Cells** 477
 Chin Fhong Soon, Hiung Yin Yap, Mohd Khairul Ahmad,
 Kian Sek Tee and Siew Hwa Gan

**Rutile Phased Titanium Dioxide (TiO₂) Nanorod/Nanoflower
 Based Waste Water Treatment Device** 483
 M.K. Ahmad, Adila Fitrah Abdul Aziz, C.F. Soon, N. Nafarizal,
 Abd Hamed Noor Kamalia, Shimomura Masaru and K. Murakami

**Design—Simulation—Optimization Environment of Specialized
 MEMS** 491
 Magdalena A. Ekwińska, Grzegorz Janczyk, Tomasz Bieniek,
 Piotr Grabiec, Jerzy Zajac and Jerzy Wąsowski

**Instability in CdTe Detector Characterized by Real-Time
 Measurement of Pulse Height and Carrier Transit Time** 499
 Hisaya Nakagawa, Tsuyoshi Terao, Tomoaki Masuzawa, Tetsu Ito,
 Hisashi Morii, Akifumi Koike, Volodymyr Gnatyuk and Toru Aoki

**Measurement and Controlling Magnetic Field Strength
 by Using Hall Effect Sensors with Classical Algorithm** 507
 Sławomir Krzysztof Czubaj and Edyta Ładyżyńska-Kozdraś

The SPM Scanner Head Based on Piezoelectric Unimorph Disc 513
 Krzysztof Tyszka, Mateusz Dawidziuk, Roland Nowak
 and Ryszard Jablonski



<http://www.springer.com/978-3-319-46489-3>

Recent Global Research and Education: Technological Challenges

Proceedings of the 15th International Conference on Global Research and Education Inter-Academia 2016

Jabłoński, R.; Szewczyk, R. (Eds.)

2017, XV, 518 p. 290 illus., Softcover

ISBN: 978-3-319-46489-3