

Table of Contents

Preface and Committee

Theory of the Water Battery

A. Widom, J. Swain and Y. Srivastava 1

Biomimetic Sensors of the Mechanoelectrical Transduction Based on the Polyelectrolyte Gels

F. Blyakhman, A. Safronov and T. Shklyar 4

The Observations of Martensitic Transformations in SUS316 by Using a Sensitive Flux-Gate Sensor

K. Yamada, Y. Isobe, T. Todaka and H. Simoji 8

A Novel Material for Chemical Sensor Applications: Oxidized MEH-PPV

P. Shabani, F.A. Boroumand and F. Hossein-Babaei 12

Electronic State and Piezoresistivity Analysis of Zinc Oxide Nanowires for Force Sensing Devices

K. Nakamura 16

Organometallic Approach for the Preparation of Zinc Oxide Nanostructured Gas Sensitive Layers

J. Jońca, L.M. Kahn, K. Fajerweg, B. Chaudret, A. Chapelle, P. Menini and P. Fau 22

Nanometric Modelisation to Characterize Dynamics Carriers in a HEMT Heterostructure (AlGaAs/GaAs) Using an Effectif Doping

I. Bouneb and K. Fouad 26

Morphological and Electrical Properties of Stretched Nanoparticle Layers

J. Ivančo, K. Végso, P. Šiffalovič, D. Kostiuik, Y. Halahovets, I. Klačková, M. Kotlar, Š. Luby and E. Majková 31

Synthesis and Magnetic Properties of Iron Nanoellipsoids Bioinspired by Magnetotactic Bacteria

C. Luna, E.D. Barriga-Castro and R. Mendoza-Reséndez 35

Parameters Affecting the Magnetoelectric Response of Magnetostrictive/Piezoelectric Polymer Laminates

A. Lasheras, J. Gutiérrez, J.M. Barandiarán, D.A. Shishkin and A.P. Potapov 40

Processing of an Integrated Optical Sensor with Almost 100% Quantum Efficiency

I. Jonak-Auer and S. Jessenig 45

Optically Stimulated Electron Emission from Surface States of SiO₂:Ge Films

E. Buntov, A. Zatsepin, H.J. Fitting and B. Schmidt 49

Innovative On-Line Oil Sensor Technologies for the Condition Monitoring of Wind Turbines

E. Gorritxategi, A. García-Arribas and A. Aranzabe 53

Low Energy Standard Model Interactions in Condensed Matter

J. Swain, A. Widom and Y.N. Srivastava 57

Application of Ink-Jet Printing and Spray Coating for the Fabrication of Polyaniline/Poly(N-Vinylpyrrolidone)-Based Ammonia Gas Sensor

N. Peřinka, M. Držková, D.V. Randjelović, P. Bondavalli, M. Hajná, P. Bober, T. Syrový, Y. Bonnassieaux and J. Stejskal 61

Anisotropic Co-Hf Thin Films for Micro-Sensors and Micro-Transducers

V. Madurga, C. Favieres and J. Vergara 65

Fully Ionized Plasmas and Nuclear Electron Capture Reactions

A. Widom, J. Swain and Y.N. Srivastava 70

Characterization of Thermochromic Fibers' Response to Temperature Change

C.G. Vossou, S.M. Potirakis, S. Simeonidis and S. Vassiliadis 74

Failure Detection Method for GaN-Based Dosimetric Systems

P. Guiral, J.M. Galvan, P. Pittet, R.X. Wang, G.N. Lu, P. Jalade and D. Dauvergne 78

High-Level Sound Classification in the ESOUNDMAPS Project

S.A. Mitilineos, S.M. Potirakis, N.A. Tatlas and M. Rangoussi 83

Mathematical Model Switched Reluctance Motor

C. Morón, A. Garcia and J.A. Somolinos 87

A Smart Sensor Platform for Greenhouse Applications N.A. Tatlas, D. Ballios, S.M. Potirakis, C. Charitou, S. Koutroubinas and M. Rangoussi	92
FEA Simulation Model in Support of the Mechanical Reliability of Automotive Exhaust Gas Temperature Sensors Z.X. Xing, J.R. Nicholls and S.A. Impey	96
Performance Optimization of a Capacitive Pressure Sensor K. Fouad, K. Salah and A. Beddiaf	101
Multi-Dimensional Switching of Ring Currents in Nonplanar Chiral Aromatic Molecules by Ultrashort Linearly Polarized UV Laser Pulses H. Mineo, S.H. Lin and Y. Fujimura	106
Poling Effects in Melt-Spun PVDF Bicomponent Fibres B. Glauß, M. Jux, S. Walter, M. Kubicka, G. Seide, P. Wierach, T. Gries and G. Roth	110
LASER Reduced Graphene on Flexible Substrate for Strain Sensing Applications: Temperature Effect on Gauge Factor S. Sayed, M. Gamil, A.M.R. Fath El-Bab and A.A.E.M. Abd Elmoneim	115
Printable, Transparent Force Sensing Resistive Materials for Touchscreen Applications S. Dempsey, M. Szablewski, D. Bloor and D. Atkinson	120
Evaluation of Depletion Layer Width in Antimony-Doped Tin Oxide Thin Films for Gas Sensors J.Q. Liu, Z.X. Zhai, G.H. Jin, X.S. Liu and L. Quan	125
New Porous Nanocomposite Materials for Electrochemical Power Sources I. Markova, V. Milanova, T. Petrov, I. Denev and O. Chauvet	129
Complex Impedance Measurement System for the Frequency Range from 5 kHz to 100 kHz M. Simić	133
Polymeric Artificial Muscles are Linear Faradaic Motors L.L. Valero, T.F. Otero and J.G. Martinez	137
Can Human Proprioception Be Described by Physical-Chemical Equations? Proprioceptive Artificial Muscles T.F. Otero and J.G. Martinez	145
Subnanometer Aluminium Oxide Film as a Model Photochemical Sensor I.V. Tvauri, S. Khubezhov, B. Gergieva, V. Magkoeva, G. Grigorkina, A. Bliev and T.T. Magkoev	153
Towards “Green” Smart Materials for Force and Strain Sensors: The Case of Polyaniline C. Della Pina, E. Zappa, G. Busca, P. Costa, S. Lanceros-Mendéz, A. Sironi and E. Falletta	157
Development of Polymer-Permalloy Film Composites with or without Nanoparticles for Sensor and Microwave Applications L. Marcano Prieto, G.V. Kurlyandskaya, A.V. Petrov, A.P. Safronov and A.M. Murzakaev	163
Composites Based on Intermetallic Nanoparticles for a New Generation of Electrochemical Systems V. Milanova, T. Stankulov and I. Markova	167
Ferroelectric Properties and Internal Friction in Doped PZT Ceramics D. Bochenek, P. Niemiec, R. Zachariasz and R. Skulski	171
Ferroelectric-Ferromagnetic Solid Solutions of PZT-Ferrite Type D. Bochenek, P. Niemiec and A. Chrobak	175
C-Pd Films as Material for Optical Sensor of Hydrogen E. Czerwosz, E. Kowalska, M. Kozłowski, M. Suchańska, M. Płaza, J. Kęczkowska, R. Belka, P. Dłużewski and K. Sobczak	179
Temperature Dependence of Responses in Metal Oxide Gas Sensors S. Rahbarpour, S. Sajed and H. Ghafoorifard	181
Real-Time Analysis of Chemotactic Motion of <i>Euglena</i> Cells Confined in a Microchip Toxicity Sensor K. Ozasa, J.S. Lee, S. Song and M. Maeda	185
Improvement of Magnetic Force Microscope Performance by Tuning the Coating Material of Sensor Tip M. Futamoto and M. Ohtake	189
An Efficient RADFET Sensors Model Using Artificial Neural Network (ANN) F. Meddour, Z. Dibi, S. Kouda and F. Djeffal	196

Magnetic Nanoparticles of $(\text{Co}_{0.94}\text{Fe}_{0.06})_{72.5}\text{Si}_{12.5}\text{B}_{15}$ and $\text{Fe}_{78}\text{Si}_9\text{B}_{13}$ Obtained by Electric Explosion of Amorphous Wires	
I.V. Beketov, R. Pérez, A.V. Bagazeev, M. Vazquez, A.I. Medvedev, A. Safronov and G.V. Kuryandskaya	203
Magnetic Microfluidic Platform for Biomedical Applications Using Magnetic Nanoparticles	
M. Stipsitz, G. Kokkinis, C. Gooneratne, J. Kosel, S. Cardoso, F. Cardoso and I. Giouroudi	207
Co/Cu/Co Pseudo Spin-Valve System Prepared by Magnetron Sputtering with Different Argon Pressure	
A.V. Svalov, A.N. Sorokin, P.A. Savin, A. García-Arribas, A. Fernández, V.O. Vas'kovskiy and G.V. Kuryandskaya	211
Simple Set-Up for Adiabatic Measurements of Magnetocaloric Effect	
P. Álvarez-Alonso, J. López-García, G. Daniel-Perez, D. Salazar, P. Lázpita, J.P. Camarillo, H. Flores-Zuñiga, D. Rios-Jara, J.L. Sánchez-Llamazares and V.A. Chernenko	215
Fabrication of Patterned Ferromagnetic Shape Memory Thin Films	
P. Álvarez-Alonso, A. Pérez-Checa, I.R. Aseguinolaza, J. Alonso, A.V. Svalov, V.A. Chernenko and J.M. Barandiarán	219
Correlation of Cooling Conditions with the Shape of Hysteresis Loops in Air Cooled and Quenched Axis Shaft	
A. Tsoutsias	223
Preparation of Fe(Pt,Pd) Alloy Thin Films with Flat Surfaces on MgO(001) Single-Crystal Substrates	
M. Ohtake, A. Itabashi, M. Futamoto, F. Kirino and N. Inaba	227
Magneto-Optical Sensor Based on Fiber Bragg Gratings and a Magnetostrictive Material	
R. Amat, H. García-Miquel, D. Barrera, G.V. Kuryandskaya and S. Sales	232
Dynamic Sensitivity and Noise Floor of a Bonded Magneto(Elasto)Electric Laminate for Low Frequency Magnetic Field Sensing under Strain Modulations	
X. Zhuang, M. Lam Chok Sing, C. Dolabdjian, Y. Wang, P. Finkel, J. Li and D. Viehland	236
Optimization of Distribution Functions for the Inverse Preisach Model by Genetic Algorithms	
M. Amir, M. Zergoug, S. Azzi, M. Sahnoun and M. Boudjerda	240
Graphite Dispersoids Enhance the Tribology of a Non-Ferrous Bulk Metallic Glass	
K. Karalis and P. Tserotas	250
Foreign-Particle Reinforcement of a Zr-Cu-X BMG	
P. Tserotas and K. Karalis	254
Microstructural Evaluation of Annealed Low-Alloy Carbon Steels with the Magnetic Barkhausen Noise	
N.P. Kanellopoulos	258
Correlation of the Barkhausen Noise with Metallurgical and Mechanical Characteristics of Welded Low Carbon Steel	
P. Vourna, A. Ktena and E. Hristoforou	262
Magnetometry in Space Exploration	
E. Mangiorou	266
Fourier Analysis for Orthogonal and Parallel Fluxgate	
N. Hadjigeorgiou, C. Konstantopoulos and D. Masxas	270
Evaluation of the Welding Zones' Magnetic Anisotropy by Using Magnetic Barkhausen Noise	
C. Sokos	274
Variations of the Magnetic Permeability and Barkhausen Noise in a Welded Low Carbon Steel	
L. Statharas	278
Abinitio Micromagnetic Calculations in Steel with Ferromagnetic Behavior	
C. Stefani	282