

# Table of Contents

## Preface and Committees

## Chapter 1: Fundamental Problems of Magnetism

|                                                                                                                                                                                                                                    |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Phase Transitions in the Antiferromagnetic Heisenberg Model on a Triangular Lattice with the Next-Nearest Neighbor Interactions</b><br>A.K. Murtazaev and M.K. Ramazanov                                                        | 3   |
| <b>1-xLaCe<sub>x</sub>CuO<sub>4</sub> in Comparison with Hole-Doped Cuprates</b><br>A. Sherman                                                                                                                                     | 11  |
| <b>Ising Antiferromagnet with Nearest-Neighbor and Next-Nearest-Neighbor Interactions on a Square Lattice</b><br>A.K. Murtazaev, M.K. Ramazanov and M.K. Badiev                                                                    | 17  |
| <b>Fundamental Limitations of Half-Metallicity in Spintronic Materials</b><br>A. Solontsov                                                                                                                                         | 22  |
| <b>Electronic Structure and Magnetic Properties of Iron Doped TiO<sub>2</sub> (Rutile): XPS Measurements and CPA Calculations</b><br>M.A. Korotin, N.A. Skorikov, E.Z. Kurmaev, D.A. Zatsepin and S.O. Cholakh                     | 28  |
| <b>Statistical and Multifractal Properties of Barkhausen Jumps in Exchange-Coupled Antiferromagnetic/Ferromagnetic Bilayers</b><br>I.V. Shashkov, M.A. Lebyodkin and V.S. Gornakov                                                 | 35  |
| <b>Modulated Nanomagnetism</b><br>A.K. Murtazaev and Z.G. Ibaev                                                                                                                                                                    | 41  |
| <b>Electronic Structure of Nonstoichiometric LaMnO<sub>3-x</sub> Calculated in the Coherent Potential Approximation</b><br>M.A. Korotin, N.A. Skorikov and V.I. Anisimov                                                           | 46  |
| <b>The Investigation of Phase Transitions in Two-Dimensional 3-State Antiferromagnetic Potts Model on a Triangular Lattice with Interaction of Next Nearest Neighbors</b><br>A.K. Murtazaev, A.B. Babaev and F.A. Kassan-Ogly      | 52  |
| <b>Partially Disordered State in the Frustrated Heisenberg Ferrimagnet</b><br>S.N. Martynov                                                                                                                                        | 55  |
| <b>Incommensurate Magnetic Structures in the Rhombohedrally Distorted Cubic Lattice</b><br>S.N. Martynov                                                                                                                           | 61  |
| <b>Peculiarities of the Magnetocaloric Effect in an Isotropic Antiferromagnet</b><br>F.A. Kassan-Ogly, E.E. Kokorina and M.V. Medvedev                                                                                             | 66  |
| <b>Phase Transitions between Magnetic Incommensurate States of Terbium Manganite in Magnetic Field</b><br>I.E. Chupis and H.A. Kovtun                                                                                              | 71  |
| <b>Upper Critical Field in Electron-Doped Superconductor with Nonstoichiometric Disorder near Antiferromagnetic-Superconducting Phase Boundary</b><br>T.B. Charikova, N.G. Shelushinina, G.I. Harus, D.S. Petukhov and A.A. Ivanov | 77  |
| <b>Effect of Cobalt Deficiency on Physical Properties of the GdBaCo<sub>2-x</sub>O<sub>5+δ</sub> Single Crystal</b><br>T.I. Arbuzova, S.V. Telegin, S.V. Naumov, E.I. Patrakov and O.G. Reznitskih                                 | 83  |
| <b>The Effect of Mechanical Stresses on the Coercive Force of the System of Two-Phase Interacting Nanoparticles</b><br>L.L. Afremov and I.G. Iliushin                                                                              | 89  |
| <b>Quantum Theory of Magnetoelectric Properties of Rare-Earth Alumoborates: Holmium Alumoborate</b><br>N.V. Kostyuchenko, A.I. Popov and A.K. Zvezdin                                                                              | 95  |
| <b>Percolation Effects in Composites Superconductor – Ferromagnetic Half-Metal</b><br>V.V. Kononenko, V.Y. Tarenkov, A.I. Dyachenko and V.N. Varyukhin                                                                             | 100 |
| <b>Magnetoelastic Resonance in Media with the Inhomogeneous Coupling Parameter</b><br>V.A. Ignatchenko and D.S. Polukhin                                                                                                           | 105 |
| <b>Hyperfine Interactions on Magnetic Ions Nuclei in Titanates</b><br>P.A. Agzamova, Y.V. Leskova and A.E. Nikiforov                                                                                                               | 109 |

|                                                                                                                                                                                                                                                      |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Thermodynamic and Relaxation Processes near Curie Point in Gadolinium</b><br>A.P. Kamantsev, V.V. Koledov, V.G. Shavrov and I.S. Tereshina                                                                                                        | 113 |
| <b>Phase Transitions in Magnets with Competing Exchange Interactions</b><br>V.I. Belokon and O.I. Dyachenko                                                                                                                                          | 119 |
| <b>Magnetic Phase Diagrams of <math>\text{Tm}_2\text{Fe}_{19-x}\text{Mn}_x</math> and <math>\text{Tm}_2\text{Fe}_{17+\delta}</math> Systems</b><br>A.G. Kuchin, A.M. Gabay, G.M. Makarova, V.I. Voronin, I.F. Berger, S.P. Platonov and A.S. Volegov | 123 |
| <b>Spin Glass State in Iron-Doped <math>\text{Bi}_2\text{Fe}_{0.128}\text{Te}_{2.844}\text{Se}_{0.145}</math> Topological Insulator</b><br>L.I. Koroleva, A.S. Morozov, S.F. Marenkin, I.V. Fedorchenko and R.A. Szymczak                            | 127 |
| <b>First Principles Calculations of Magnetic Exchange Parameters of Fe-Mn-Al Heusler Alloys</b><br>M.A. Zagrebin, V.D. Buchelnikov, V.V. Sokolovskiy, I.A. Taranenko and S.I. Saunina                                                                | 131 |

## Chapter 2: Magnetic Films, Nanostructures and Nanoparticles

|                                                                                                                                                                                                                                                                                                          |     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Crystal Structure and Coercivity of Electrodeposited Nickel Films</b><br>E.V. Sukovatitsina, A.S. Samardak, A.V. Ognev, L.A. Chebotkevich, A.Y. Samardak, M.R. Sanaeian and F. Nasirpour                                                                                                              | 139 |
| <b>Solid-State Reactions in Fe/Si Multilayer Nanofilms</b><br>S.M. Zharkov, R.R. Altunin, E.T. Moiseenko, G.M. Zeer, S.N. Varnakov and S.G. Ovchinnikov                                                                                                                                                  | 144 |
| <b>Coercivity of Amorphous Co-P Single-Layer and Trilayer Films Fabricated by Chemical Deposition</b><br>A.V. Chzhan, S.Y. Kiparisov and G.S. Patrin                                                                                                                                                     | 150 |
| <b>Uniaxial Magnetic Anisotropy of Bismuth-Doped Ferrite-Garnet Films, Induced by Weak Adsorption</b><br>V.E. Zubov, A.D. Kudakov and N.L. Levshin                                                                                                                                                       | 154 |
| <b>Magnetic and Structural Properties of Nanocomposite <math>\text{ZnO-Fe}_3\text{O}_4</math> Films Prepared by Solid-State Synthesis</b><br>L.E. Bykova, V.G. Myagkov, I.A. Tambasov, O.A. Bayukov, V.S. Zhigalov, Y.L. Mikhlin, I.V. Nemtsev and G.N. Bondarenko                                       | 158 |
| <b>Magnetorefractive Effect in Doped <math>\text{La}_{1-x}\text{K}_x\text{MnO}_3</math> Thin Films</b><br>E.A. Gan'shina, Y.P. Sukhorukov, A.V. Telegin, V.D. Bessonov and A.R. Kaul                                                                                                                     | 163 |
| <b>Synthesis of Ferromagnetic Germanides in 40Ge/60Mn Films: Magnetic and Structural Properties</b><br>V.G. Myagkov, A.A. Matsunin, Y.L. Mikhlin, V.S. Zhigalov, L.E. Bykova, I.A. Tambasov, G.N. Bondarenko, G.S. Patrin and D.A. Velikanov                                                             | 167 |
| <b>Ensembles of <math>\gamma\text{-Fe}_2\text{O}_3</math> Nanoparticles Formed during Devitrification of Borate Glasses</b><br>O.S. Ivanova, I.S. Edelman, R.D. Ivantsov, E.A. Petrakovskaya, D.A. Velikanov, N.N. Trofimova and Y.V. Zubavichus                                                         | 173 |
| <b>Influence of Fe-Co Ratio and Ni,Cr Dopants on Structural Evolution of Metallic Amorphous Alloys</b><br>A. Kotvitckii, G.S. Kraynova, A.M. Frolov, V. Ivanov and V.S. Plotnikov                                                                                                                        | 179 |
| <b>Structure Evolution of Fe- and Co-Based Amorphous Alloys Studied by the Electrical Resistivity Measurements</b><br>A. Kotvitckii, G.S. Kraynova, A.M. Frolov, V. Ivanov and V.S. Plotnikov                                                                                                            | 185 |
| <b>Evolution of Structure-Scaling and Magnetic Properties during Thermal Loading of Melt-Spun <math>\text{Fe}_{70}\text{Cr}_{15}\text{B}_{15}(\text{Sn})</math> Alloys</b><br>T.A. Pisarenko, A.M. Frolov and G.S. Kraynova                                                                              | 190 |
| <b>Nanocrystalline Soft Magnetic Fe-, Co-Based Alloys Doped by Hf, Mo and Zr with Enhanced Thermal Stability of Magnetic Properties</b><br>A.P. Potapov, N.V. Dmitrieva, V.A. Lukshina, E.G. Volkova and B.N. Filippov                                                                                   | 196 |
| <b>Influence of Magnetostatic Interactions on Magnetization Process of Iron-Containing Coatings, Produced Using the Plasma Electrolytic Oxidation Method</b><br>P.V. Kharitonskii, A.M. Frolov, S.A. Boev, V.S. Rudnev, I.A. Tkachenko, V.P. Morozova, I.V. Lukiyanchuk, M.V. Adigamova and A.Y. Ustinov | 200 |
| <b>Investigation of the Co Films Growth on Si (111) Surface with Copper Silicide Nanostructures</b><br>K. Ermakov, A.V. Ognev, A.S. Samardak, A. Kozlov, A. Ovsaynnikov, E. Mikoluk, L.A. Chebotkevich, A. Saranin, L. Romashev, N. Solin and V. Ustinov                                                 | 204 |

|                                                                                                                                                                                                                                                                                     |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Scaling in the Quantum Hall Regime for a Double Quantum Well Nanostructure in High Magnetic Field</b><br>Y.G. Arapov, S.V. Gudina, A.S. Klepikova, V.N. Neverov, S.G. Novokshonov, V.I. Okulov, T.B. Charikova, G.I. Harus, N.G. Shelushinina and M.V. Yakunin                   | 208 |
| <b>Magneto-Optics of Cobalt and Nickel Nanoparticles Implanted in SiO<sub>2</sub>: Comparative Study</b><br>D.A. Petrov, I.S. Edelman, R.D. Ivantsov, S.M. Zharkov and A.L. Stepanov                                                                                                | 214 |
| <b>Magnetic and Structural Properties of Granular Films Al<sub>2</sub>O<sub>3</sub>-FePd<sub>3</sub> Synthesized by Aluminothermy</b><br>V.S. Zhigalov, V.G. Myagkov, V.A. Semyachkov, G.N. Bondarenko and I.V. Nemtsev                                                             | 218 |
| <b>The Effect of Oblique Deposition with Small Incidence on Magnetic Properties of Thin Magnetic Films</b><br>B.A. Belyaev, A.V. Izotov and P.N. Solovev                                                                                                                            | 223 |
| <b>Phase Transition in Ultrathin Films</b><br>L.L. Afremov and A.A. Petrov                                                                                                                                                                                                          | 227 |
| <b>Thin Magnetic Films with Artificial Texture on Substrate: Microwave Properties</b><br>B.A. Belyaev, A.V. Izotov, A.A. Leksikov, A.M. Serzhantov, K.V. Lemberg and P.N. Solovev                                                                                                   | 233 |
| <b>Effect of Sodium Hypophosphite Content to the Deposition Rate, Structure and Magnetic Properties of Electroless Deposited Ni-P Alloy</b><br>R.N. Yaroslavtsev, L.A. Chekanova, S.V. Komogortsev and R.S. Iskhakov                                                                | 237 |
| <b>Perpendicular Magnetic Anisotropy and Atomic Ordering in FePd, Fe<sub>50</sub>Pd<sub>50-x</sub>Pt<sub>x</sub> Alloy Films</b><br>E.M. Artemyev and L.E. Yakimov                                                                                                                  | 242 |
| <b>Phase Transitions in the Two-Layer Ferrite-Garnet Film</b><br>J.A. Siryuk and A.V. Bezus                                                                                                                                                                                         | 246 |
| <b>The Second-Order Spin-Reorientation Phase Transition in Thin Magnetic Film</b><br>J.A. Siryuk and A.V. Bezus                                                                                                                                                                     | 250 |
| <b>Magneto-Optical Properties of Co/TiO<sub>2</sub> Layered Films</b><br>V.V. Polyakov, K.P. Polyakova, V.A. Seredkin and G.S. Patrin                                                                                                                                               | 254 |
| <b>Morphology and Structure of the Interface Layers in Ni/Ge Thin Films</b><br>Y.E. Greben'kova, I.S. Edelman, A.V. Chernichenko, D.A. Velikanov, S.M. Zharkov and I.A. Turpanov                                                                                                    | 259 |
| <b>Influence of Heating Temperature on the ΔE-Effect of Amorphous Fe<sub>75</sub>Si<sub>10</sub>B<sub>15</sub> Wires</b><br>A. Semenov, E. Golygin, A. Gavriluk, A. Mokhovikov, A. Gafarov and N. Morozova                                                                          | 264 |
| <b>Definition of Amorphous Tapes Magnetic Condition Using Temperature Dependence of the Saturation Magnetic Moment</b><br>V. Pechnikov                                                                                                                                              | 268 |
| <b>Magnetic and Magnetoresonance Properties of Multilayered Systems Based on (CoFeB)<sub>x</sub>-(SiO<sub>2</sub>)<sub>100-x</sub> Composite Layers</b><br>J. Chekrygina, A. Devizenko, Y. Kalinin, S. Kirov, E. Lebedeva, I. Shipkova, A. Sitnikov, N. Syr'ev and S. Vyzulin       | 272 |
| <b>Effect of Substrate RF-Bias on Exchange Coupling in Fe<sub>20</sub>Ni<sub>80</sub>/Fe<sub>50</sub>Mn<sub>50</sub> Films</b><br>A.N. Gor'kovenko, V.N. Lepalovskij, V.O. Vas'kovskiy, P.A. Savin and N.N. Shchegoleva                                                             | 278 |
| <b>Simulation of the Motion of Magnetic Nanoparticles in Human Tissues</b><br>P. Andriushenko, L.L. Afremov and M. Chernova                                                                                                                                                         | 284 |
| <b>Magnetic Properties of Co Thin Films Evaporated under Normal and Oblique Incidence</b><br>A. Kharmouche                                                                                                                                                                          | 288 |
| <b>Temperature Dependence of Magnetic Saturation in Electrodeposited Nanocrystalline Nickel Films</b><br>A.Y. Samardak, V. Pechnikov, E.V. Sukovatitsina, A.S. Samardak, A.V. Ognev, L.A. Chebotkevich, H. Mahdizadeh, A. Akbari and F. Nasirpour                                   | 292 |
| <b>Magnetic Behavior of Single Ni Nanowires and its Arrays Embedded in Highly Ordered Nanoporous Alumina Templates</b><br>A.S. Samardak, A.V. Ognev, E.V. Sukovatitsina, M.E. Steblyi, E.B. Modin, L.A. Chebotkevich, R. Mahmoodi, M.G. Hosseini, S.M. Peighambari and F. Nasirpour | 298 |

### **Chapter 3: Magnetoelectronic and Magnetoresistive Materials, Spin Polarized Transport**

|                                                                                                                                                                                                                                                             |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Spin Injection Mechanisms for Radiation and Detection of Terahertz Waves Based on Magnetic Nano Junction</b><br>E.A. Vilkov, S.G. Chigarev and P.E. Zilberman                                                                                            | 309 |
| <b>Stress Dependence of Photoinduced Magnetostriction in Yttrium Iron Garnets</b><br>N.V. Vorob'eva                                                                                                                                                         | 314 |
| <b>The Influence of Magnetic Inhomogeneous State on Thermopower and Magnetothermopower in <math>\text{Sm}_{0.55}\text{Sr}_{0.45}\text{MnO}_3</math> Manganites</b><br>L.I. Koroleva, A.S. Morozov and E.S. Zhakina                                          | 320 |
| <b>Magnetoimpedance of Amorphous Ribbons with Polymer Covering</b><br>A.A. Moiseev, A.V. Petrov, M.S. Derevyanko, V.A. Lukshina, A.P. Potapov, D.A. Bukreev, A.V. Semirov, A.P. Safronov and G.V. Kurlyandskaya                                             | 325 |
| <b>Interfacial Electronic Scattering in Fe/Cr Superlattices</b><br>I.D. Lobov, M.M. Kirillova, L.N. Romashev, M.A. Milyaev and V.V. Ustinov                                                                                                                 | 331 |
| <b>Magnetoimpedance of Amorphous Ferromagnetic CoFeSiB Ribbons in the Wide Temperature Range</b><br>A.V. Semirov, M.S. Derevyanko, D.A. Bukreev, A.A. Moiseev and G.V. Kurlyandskaya                                                                        | 337 |
| <b>Nanostructured Magnetoimpedance Multilayers with Different Thickness of FeNi Components</b><br>A.A. Chlenova, G.V. Kurlyandskaya, S.O. Volchkov, V.N. Lepalovskij and R. El Kammouni                                                                     | 342 |
| <b>Magnetic and Electrical Properties of Co/Ge Bilayer Films</b><br>G.S. Patrin, I.A. Turpanov, K.G. Patrin, E.A. Alekseichik, A.V. Kobayakov and V.I. Yushkov                                                                                              | 348 |
| <b>Features of Magnetic, Magnetoelectric and Magnetoelastic Properties of <math>\text{HoAl}_3(\text{BO}_3)_4</math></b><br>A.I. Begunov, A.A. Demidov, I.A. Gudim and E.V. Eremin                                                                           | 352 |
| <b>Interface Structure and Magnetoresistance Studies of <math>[\text{Co/C}]_n</math> Superlattices by Means of NMR and TEM</b><br>S.A. Chuprakov, T.P. Krinitsina, N.S. Bannikova, I.V. Blinov, S.V. Verkhovskii, M.A. Milyaev, V.V. Popov and V.V. Ustinov | 358 |
| <b>Magnetoelectric Polarization of Paramagnetic <math>\text{HoAl}_{3-x}\text{Ga}_x(\text{BO}_3)_4</math> Single Crystals</b><br>I.A. Gudim, E.V. Eremin, M.S. Molokeev, V.L. Temerov and N.V. Volkov                                                        | 364 |
| <b>Magnetization Dynamics and Electron Transport in the <math>\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3/\text{Y}_3\text{Fe}_5\text{O}_{12}</math> Hybrid Structures</b><br>N.V. Volkov, D.A. Smolyakov, M.V. Rautskii, V.I. Chichkov and Y.M. Mukovskii    | 368 |
| <b>Magnetic and Dielectric Properties of <math>\text{PbFeBO}_4</math> and <math>\text{PbMnBO}_4</math> Single Crystals</b><br>A.I. Pankrats, K.A. Sablina, D.A. Velikanov, O.A. Bayukov, A.M. Vorotynov, A.D. Balaev, M.S. Molokeev and M.I. Kolkov         | 372 |
| <b>Magnetoelectric Properties of <math>\text{Nd}_x\text{Bi}_{1-x}\text{FeO}_3</math> Thin Films</b><br>S.S. Aplesnin, V.V. Kretinin, A.A. Ostapenko, A.I. Galyas and K.L. Yanushkevich                                                                      | 378 |

## Chapter 4: Spin-Wave Dynamics

|                                                                                                                                                                                     |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Spin-Wave Spectrum in the Sinusoidal Superlattice with Amplitude and Phase Inhomogeneities</b><br>V.A. Ignatchenko and D.S. Tsikalov                                             | 385 |
| <b>Multimode Surface Magnetostatic Wave Propagation in Irregular Planar YIG Waveguide</b><br>E.N. Beginin, A.V. Sadovnikov, Y.P. Sharaevsky and S.A. Nikitov                        | 389 |
| <b>Nonlinear Magnetostatic Wave Propagation through One Dimensional Finite Magnonic Crystals</b><br>S.E. Sheshukova, E.N. Beginin, M.A. Morozova, Y.P. Sharaevskii and S.A. Nikitov | 394 |
| <b>Photovoltage Spectroscopy of Dipolar Spin Waves in Dy Micromagnets</b><br>A. Nogaret, M.E. Steblyi, J.C. Portal, A.S. Samardak, A. Ognev, H.E. Beere and D.A. Ritchie            | 400 |

## Chapter 5: Domain Structure and Walls

|                                                                                                                                                |     |
|------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Domain Structures in Films with Combined Magnetic Anisotropy. Two-Dimensional Simulation</b><br>M.N. Dubovik, V.V. Zverev and B.N. Filippov | 409 |
|------------------------------------------------------------------------------------------------------------------------------------------------|-----|

|                                                                                                                                                                  |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>The Domain Structure and Magnetic Hysteretic Properties of <math>\text{Mn}_{55.5}\text{Al}_{44}\text{C}_{0.5}</math> Alloy in Different Structural States</b> |     |
| G.F. Korznikova                                                                                                                                                  | 415 |
| <b>3-D Simulations of Micromagnetic Transition Structures in Vortex Asymmetric Domain Walls</b>                                                                  |     |
| V.V. Zverev, M.N. Dubovik and B.N. Filippov                                                                                                                      | 421 |
| <b>Investigation of Evolution of Domain Structure in Iron Garnet <math>\text{Tb}_{0.26}\text{Y}_{2.74}\text{Fe}_5\text{O}_{12}</math></b>                        |     |
| L.N. Niyazov and D.R. Djuraev                                                                                                                                    | 427 |
| <b>Manipulation of Magnetic Properties and Domain Wall Dynamics in Amorphous Ferromagnetic Microwires by Annealing under Applied Stress</b>                      |     |
| K. Chichay, V. Rodionova, V. Zhukova, M. Ipatov and A. Zhukov                                                                                                    | 432 |
| <b>Experimental Study and Numerical Modelling of Magnetic Domain Walls Drift in Ferrite Garnet Crystals</b>                                                      |     |
| L.A. Pamyatnykh, G.A. Shmatov, M.S. Lysov, S.E. Pamyatnykh and D.S. Mehonoshin                                                                                   | 437 |

## Chapter 6: Advanced Experimental Techniques

|                                                                                                                             |     |
|-----------------------------------------------------------------------------------------------------------------------------|-----|
| <b>The Improved Magneto-Optical Kerr Effect Method of Magnetic Anisotropy Measurements in Thin Films and Nanostructures</b> |     |
| M.E. Stebliy, A.V. Ognev, A.S. Samardak, G. Tregubov, E. Mikoluk and L.A. Chebotkevich                                      | 445 |
| <b>Lorentz's Electron Microscopy of Thin Films with Frustrated Magnetic Structure</b>                                       |     |
| L.I. Kveglis, R.B. Abylkalykova, A.V. Djes, M.N. Volochaev, A.G. Cherkov and M.V. Gorev                                     | 448 |
| <b>The Experimental Setup for Measuring of Thermal Parameters of Magnetic Fluids in AC Magnetic Field</b>                   |     |
| T.M. Elkhova, Y.K. Gun'ko, A.P. Pyatakov, Y.I. Spichkin, K. Dawson and A.M. Tishin                                          | 454 |
| <b>Spot Electron-Beam Lithography as a Novel Method of High Resolution Pattern Nanofabrication</b>                          |     |
| A.S. Samardak, M.V. Anisimova, A.V. Ognev, V.Y. Samardak and L.A. Chebotkevich                                              | 459 |

## Chapter 7: Magnetic Memories, Sensors, Devices and Materials

|                                                                                                                                             |     |
|---------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Metallic Contaminant Detection System Using Multi-Channel Superconducting Quantum Interference Device (SQUID)</b>                        |     |
| S. Tanaka, T. Ohtani, Y. Uchida, T. Chigasaki and Y. Hatsukade                                                                              | 465 |
| <b>X-Ray and Magnetic Measurements of <math>\text{TmFeTi}_2\text{O}_7</math></b>                                                            |     |
| T.V. Drokina, G.A. Petrakovskii, D.A. Velikanov and M.S. Molokeev                                                                           | 470 |
| <b>Sharp Angular Dependence of Free Layer Coercivity in Spin Valves with Ferromagnetic Interlayer Coupling</b>                              |     |
| L.I. Naumova, M.A. Milyaev, N.G. Bebenin, T.A. Chernyshova, V.V. Proglyado, T.P. Krinitsina, N.S. Bannikova, I.Y. Kamensky and V.V. Ustinov | 474 |
| <b>Synthesis and Study of the New Class of Magnetic Bioceramics for Biomedical Applications: Mossbauer Studies</b>                          |     |
| M.V. Tkachenko, A.S. Kamzin, L.P. Ol'khovik, T.M. Tkachenko and S. Keshri                                                                   | 480 |
| <b>The Investigation of Long-Range Exchange Interaction in Spin Valve Structures</b>                                                        |     |
| P.D. Kim, G.S. Patrin, I.A. Turpanov, D.A. Marushchenko, L.A. Lee and T.V. Rudenko                                                          | 489 |
| <b>Transformations of Space-Modulated Structures in <math>\text{BiFeO}_3</math> – Like Multiferroics</b>                                    |     |
| Z.V. Gareeva, A.F. Popkov, S.V. Soloviov and A.K. Zvezdin                                                                                   | 495 |
| <b>Magnetic Bistability of the “Small Disk on Big Disk” Structure</b>                                                                       |     |
| M.E. Stebliy, A.V. Ognev, A.S. Samardak, M. Anisimova, V. Ryabov, A. Kolesnikov and L. Chebotkevich                                         | 499 |
| <b>Electrical and Dielectrical Properties of Gas-Sensor Resistive Type <math>\text{Bi}_2\text{Sn}_2\text{O}_7</math></b>                    |     |
| L.V. Udod, M.N. Sitnikov, S.S. Aplesnin and M.S. Molokeev                                                                                   | 503 |