

# Table of Contents

## Foreword, Committees and Contributors

## Chapter 1: Theory Research and Numerical Simulation

### Anomalous Temperature and Field Behaviors of Magnetization in Cubic Lattice Frustrated Ferromagnets

A.N. Ignatenko, A.A. Katanin and V.Y. Irkhin 3

### Coarsening in Critical Dynamics of 2D XY-Model

I. Popov and P. Prudnikov 8

### Green's Function of Magnetoelastic Waves

V.A. Ignatchenko and D.S. Polukhin 12

### Spin Excitations in Chiral Model of Graphene

Y.P. Rybakov 16

### Low-Temperature Spin Fluctuations beyond Spin Waves

N.B. Melnikov and B.I. Reser 20

### Spin Fluctuations in Disordered Metallic Ferrimagnetic Alloys

V.I. Grebennikov and D.I. Radzivonchik 25

### The Investigation of Critical Properties of the Transition from Modulated Phase into Paramagnetic Phase

A.K. Murtazaev and Z.G. Ibaev 30

### Adsorption and Magnetic Properties of Ultrathin Fe and Ni Alloy Films with an Inhomogeneous Magnetization Distribution

D.V. Pilipenko, M.V. Mamonova and V.V. Prudnikov 34

### Edge Rotational Magnons in Magnonic Crystals

I. Lisenkov, D. Kalyabin and S. Nikitov 38

### Finite Size Effects in Magnetic Multilayers Induced by Interaction with the Substrate

M.V. Kostyuchenko 43

### Green's Functions of Spin and Electromagnetic Waves in the Sinusoidal Superlattice

V.A. Ignatchenko and D.S. Tsikalov 47

### Resonant Dynamics of the Domain Walls in Multilayer Ferromagnetic Structure

E.G. Ekomasov, A.M. Gumerov, R.R. Murtazin, R.V. Kudryavtsev, A.E. Ekomasov and N.N. Abakumova 51

### Peierls "Washboard" Controls Dynamics of the Domain Walls in Molecular Ferrimagnets

M. Kirman, A. Talantsev and R. Morgunov 55

### Micromagnetic Calculation of Neel Domain Wall Structure

V.S. Semenov 60

### Micro Grid Frame of Electroless Deposited Co-P Magnetic Tubes

L.A. Chekanova, E.A. Denisova, R.N. Yaroslavl'tsev, S.V. Komogortsev, D.A. Velikanov, A.M. Zhizhaev and R.S. Iskhakov 64

### Canted Spiral Magnetic Order in Layered Systems

M.T. Timirgazin, V.F. Gilmudinov and A.K. Arzhnikov 68

### Second Order Precession in the Plate with Cubic Anisotropy and Magnetoelastic Properties

M.S. Kirushev, V.S. Vlasov, D. Pleshev, F.F. Asadullin, L.N. Kotov, V.G. Shavrov and V.I. Shcheglov 73

### Influence of Quenched Nonmagnetic Impurities on Phase Transitions in Two-Dimensional 3-State Antiferromagnetic Potts Model on Triangular Lattice

A.B. Babaev, A.K. Murtazaev and R.A. Murtazaliev 79

### Autoresonant Excitation of Spin Wave "Dark" Solitons

M.A. Borich, A.P. Tankeev and A.G. Shagalov 82

### Phase Transitions in Frustrated Ising Antiferromagnet on a Body-Centered Cubic Lattice with Next-Nearest Neighbor Interactions

A.K. Murtazaev, M.K. Ramazanov and D.R. Kurbanova 86

## Chapter 2: Magnetic Semiconductors and Oxides

|                                                                                                                                                                                                                                                                                                                |     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Ferromagnetism in GaAs/InAs/GaAs Quantum Dot Layer Delta-Doped with Mn</b><br>V.A. Kulbachinskii, L.N. Oveshnikov and B.A. Aronzon                                                                                                                                                                          | 93  |
| <b>Galvanomagnetic and Magnetic Properties of <math>\text{Pb}_{1-y}\text{Sc}_y\text{Te}</math></b><br>E.P. Skipetrov, M.M. Markina, K.V. Zakharov, L.A. Skipetrova, A.A. Solovev, A.V. Knotko, E.I. Slynko and V.E. Slynko                                                                                     | 97  |
| <b>Magneto-Optical Evidence for Intrinsic Ferromagnetism in (Ga,Mn)As Layers Grown by Pulsed Laser Deposition</b><br>E.A. Gan'shina, L.L. Golik, Z.E. Kun'kova, V.I. Kovalev, Y.V. Markin, A.I. Novikov, G.S. Zykov, Y.A. Danilov, A.V. Kudrin, O.V. Vikhrova and B.N. Zvonkov                                 | 101 |
| <b>Effect of Mn Doping on Magnetic and Dielectric Properties of <math>\text{Bi}_2\text{Sn}_2\text{O}_7</math></b><br>L.V. Udod, S.S. Aplesnin, M.N. Sitnikov, E.V. Eremin and M.S. Molokeev                                                                                                                    | 105 |
| <b>Anomalous Hall Effect in 2D DMS</b><br>L.N. Oveshnikov, V.A. Kulbachinskii, A.B. Davydov and B.A. Aronzon                                                                                                                                                                                                   | 109 |
| <b>Magnetism of Bismuth(III) Oxide-Based Compounds</b><br>E.A. Kravchenko                                                                                                                                                                                                                                      | 113 |
| <b>Magneto-Electronic Phase Separation in <math>\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3</math> with Metallic Behavior in Paramagnetic Region</b><br>V.A. Ryzhov, V.P. Khavronin, V.V. Deriglazov, Y.M. Mukovskii and V.I. Chichkov                                                                          | 117 |
| <b>Manifestation of Donor Hybridized Electron States in Magnetism of Nickel Impurities in Mercury Selenide Crystals</b><br>T.E. Govorkova, A.F. Gubkin, A.T. Lonchakov, V.I. Okulov, M.A. Andriichuk and L.D. Paranchich                                                                                       | 121 |
| <b>Relaxation Attenuation of Ultrasound by the Jahn-Teller Centers in <math>\text{ZnSe:Cr}</math> in High Magnetic Fields</b><br>N.S. Averkiev, I.B. Bersuker, V.V. Gudkov, S. Zherlitsyn, S. Yasin, I.V. Zhevstovskikh, K.A. Baryshnikov, A.M. Monakhov, M.N. Sarychev, Y.V. Korostelin and A.I. Landman      | 125 |
| <b>Role of Magnetic Subsystems to Form a Complex Magnetic Structure <math>\text{Mn}_2\text{GeO}_4</math> Single Crystals</b><br>N.V. Volkov, N.V. Mikhashenok, K.A. Sablina, A.I. Pankrats, V.I. Tugarinov, A.D. Balaev and M.V. Gorev                                                                         | 129 |
| <b>Spin-Lattice Coupling and Peculiarities of Magnetic Behavior of Ferrimagnetic Ludwigites <math>\text{Mn}_{0.5}^{2+}\text{M}_{1.5}^{2+}\text{Mn}^{3+}\text{BO}_5</math> (<math>\text{M}=\text{Cu}, \text{Ni}</math>)</b><br>L. Bezmaternykh, E. Moshkina, E. Eremin, M. Molokeev, N. Volkov and Y. Seryotkin | 133 |
| <b>Synthesis and Magnetic Properties of <math>\beta\text{-Cu}_3\text{Fe}_4(\text{VO}_4)_6</math> Single Crystals</b><br>D.A. Balaev, O.A. Bayukov, E.V. Eremin, M.S. Molokeev, A.I. Pankrats, K.A. Sablina, D.A. Velikanov and A.M. Vorotynov                                                                  | 137 |
| <b>Giant Magnetothermopower in <math>\text{Sm}_{0.55}\text{Sr}_{0.45}\text{MnO}_3</math> Manganite</b><br>L.I. Koroleva, A.S. Morozov and E.S. Zhakina                                                                                                                                                         | 141 |
| <b>Peculiarities of Elastic Properties of RE Cobaltites <math>\text{RBaCo}_4\text{O}_7</math> (<math>\text{R} = \text{Dy} - \text{Er}, \text{Y}</math>) at Magnetic Phase Transitions</b><br>Z. Kazei, V. Snegirev, A. Andreenko, L. Kozeeva and M. Kameneva                                                   | 145 |
| <b>Femtosecond Photo-Induced Phenomena in Multiferroic Hexagonal Manganite <math>\text{YMnO}_3</math></b><br>V. Pavlov, V. Gridnev, R. Pisarev, M. Pohl, I. Akimov, D. Yakovlev and M. Bayer                                                                                                                   | 149 |
| <b>Magneto-optical Properties of <math>\text{Hg}_{1-x}\text{Cd}_x\text{Cr}_2\text{Se}_4</math> Solid Solutions</b><br>Y.P. Sukhorukov, A.V. Telegin, E.V. Mostovshchikova, N.G. Bebenin, R.I. Zainullina, E.A. Gan'shina, G.S. Zykov, V.A. Fedorov and T.K. Menschikova                                        | 153 |
| <b>Influence of Different Interlayers on the Electrical and Magnetic Properties of Multilayered Structures Based on <math>(\text{Co}_{41}\text{Fe}_{39}\text{B}_{20})_{33.9}(\text{SiO}_2)_{66.1}</math> Composite</b><br>Y.E. Kalinin, M.A. Kashirin and A.V. Sitnikov                                        | 157 |
| <b>Two Sources of Paramagnetic Curie-Type Contribution to the Normal State Magnetic Susceptibility of HTSC <math>\text{YBa}_2\text{Cu}_3\text{O}_{6+\delta}</math></b><br>L. Mamsurova, N. Trusevich, K. Pigalskiy, A. Vishnev and I. Mamsurov                                                                 | 161 |
| <b>Investigation of Hydrothermally Synthesized Greigite Magnetic Properties</b><br>M. Krivenkov, T. Gendler and A. Novakova                                                                                                                                                                                    | 165 |

|                                                                                                                                                                                                                                               |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Electron Doped CaMnO<sub>3</sub>: Mn-Site Substitution versus Ca-Site Substitution</b><br>E.V. Mostovshchikova, S.V. Naumov, R.I. Zainullina, N.G. Bebenin, T.I. Arbuzova and N.I. Solin                                                   | 169 |
| <b>Temperature Dependence of Electronic and Magnetic Properties of (DOEO)<sub>4</sub>[HgBr<sub>4</sub>]-TCE Single Crystals</b><br>A. Chernenkaya, O. Koplak, K. Medjanik, A. Kotov, R. Morgunov, E. Yagubskii, H.J. Elmers and G. Schönhense | 173 |

## Chapter 3: Magnetic Alloys and Magnetocaloric Effect

|                                                                                                                                                                                                                                                                                               |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Annealing Influence on the Exchange-Bias and Magnetostructural Properties in the Ni<sub>50.0</sub>Mn<sub>36.5</sub>Sn<sub>13.5</sub> Ribbon-Shape Alloy</b><br>L. González-Legarreta, M. Ipatov, D. González-Alonso, A.P. Kamantsev, V. Koledov, V.G. Shavrov and B. Hernando              | 179 |
| <b>Direct and Inverse Magnetocaloric Effect in Ni<sub>1.81</sub>Mn<sub>1.64</sub>In<sub>0.55</sub> Multifunctional Heusler Alloy</b><br>R. Fayzullin, V.D. Buchelnikov, M. Drobosyuk, A. Mashirov, A. Kamantsev, B. Hernando, M. Zhukov, V.V. Koledov and V.G. Shavrov                        | 183 |
| <b>First Principles Investigations of Structural and Magnetic Properties of Fe-Ni-Mn-Al Heusler Alloys</b><br>V.D. Buchelnikov, M.A. Klyuchnikova, M.A. Zagrebin and V.V. Sokolovskiy                                                                                                         | 187 |
| <b>Heat Pumping Scheme Based on Inducement of the F-AF Transition in FeRh by Pressure</b><br>V.V. Rodionov, V.V. Rodionova and M.P. Annaorazov                                                                                                                                                | 192 |
| <b>Influence of Rapid Quenching on Magnetocaloric Effect of Y<sub>2</sub>(Fe,Mn)<sub>17</sub> Intermetallic Compounds</b><br>A.I. Zvonov, N.Y. Pankratov, D. Karpenkov, A. Karpenkov and S.A. Nikitin                                                                                         | 196 |
| <b>Magnetic and Magneto-Optical Research of Ni<sub>43.7</sub>Mn<sub>43.6</sub>In<sub>12.7</sub> Ribbons</b><br>A. Novikov, E. Gan'shina, L. Gonzalez-Legarreta, V.M. Prida, B. Hernando and A. Granovsky                                                                                      | 200 |
| <b>Magnetic Phase Transitions and Magnetocaloric Effect in R<sub>2</sub>Fe<sub>17</sub> (R = Y, Tb, Er)</b><br>S.A. Nikitin, I.A. Ovchenkova, G.A. Tskhadadze and K.P. Skokov                                                                                                                 | 204 |
| <b>Magnetocaloric and Magnetoelastic Properties of the Gd<sub>5</sub>Si<sub>2</sub>Ge<sub>2</sub> with Small Indium Substitutions in p-Sublattice</b><br>S.A. Nikitin, A.E. Bogdanov, I.A. Ovchenkova, E.A. Ovchenkov, A.V. Smirnov and A.V. Morozkin                                         | 208 |
| <b>Magnetocaloric Effect and Frustrations in One-Dimensional Magnets</b><br>A.V. Zarubin, F.A. Kassan-Ogly, M.V. Medvedev and A.I. Proshkin                                                                                                                                                   | 212 |
| <b>Magnetocaloric Effect of Gadolinium at Adiabatic and Quasi-Isothermal Conditions in High Magnetic Fields</b><br>A.P. Kamantsev, V. Koledov, A.V. Mashirov, E.T. Dilmieva, V.G. Shavrov, J. Cwik and I.S. Tereshina                                                                         | 216 |
| <b>Magnetocaloric Properties of Cold Rolled Gd<sub>100-x</sub>Zr<sub>x</sub> (x = 0, 1, 2, 3) Intermetallic Alloys</b><br>S. Taskaev, K. Skokov, D. Karpenkov, V.V. Khovaylo, V.D. Buchelnikov, D.A. Zherebtsov, M. Ulyanov, D. Bataev, D. Galimov and A. Pellenen                            | 220 |
| <b>Magneto-Optical Study of Martensitic Transition in Ni<sub>45</sub>Mn<sub>36.7</sub>In<sub>13.3</sub>Co<sub>5</sub> (at. %) Single Crystals</b><br>E. Gan'shina, A. Novikov, V. Chernenko, J. Barandiaran, E. Cesari, I. Rodionov, I. Titov, V. Prudnikov and A. Granovsky                  | 225 |
| <b>Structural and Magnetic Properties of Mn<sub>2</sub>NiZ (Z = Ga, In, Sn, Sb) Heusler Alloys from <i>Ab Initio</i> Calculations</b><br>V.V. Sokolovskiy, M.A. Zagrebin, Y.A. Sokolovskaya and V.D. Buchelnikov                                                                              | 229 |
| <b>Structure, Electrical and Magnetic Properties of Ni<sub>47-x</sub>Mn<sub>42+x</sub>In<sub>11</sub> (x=0, 1, 2) Based Heusler Alloys</b><br>S.M. Emelyanova, V.V. Marchenkov, K.A. Belozerovala, E.I. Patrakov, R.L. Wang, H.B. Xiao, C.P. Yang, H.W. Weber, F. Sauerzopf and Y.V. Kaletina | 233 |
| <b>The Influence of Cold Rolling on Magnetocaloric Properties of Gd<sub>100-x</sub>Y<sub>x</sub> (x = 0, 5, 10, 15) Alloys</b><br>S. Taskaev, K. Skokov, D. Karpenkov, V.V. Khovaylo, V.D. Buchelnikov, D.A. Zherebtsov, M. Ulyanov, D. Bataev, A. Pellenen and A. Fazlitdinova               | 238 |
| <b>The Magnetocaloric Effect and Magnetic Transitions in Hydride Compounds: GdNiH<sub>3.2</sub> and TbNiH<sub>3.4</sub></b><br>A.I. Smarzhevskaya, S.A. Nikitin, V.N. Verbetsky, W. Iwasieczko and A.N. Golovanov                                                                             | 243 |

|                                                                                                                                                       |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Untypical Temperature Dependence of the Magnetocaloric Effect in the Dy(Co<sub>1-x</sub>Fe<sub>x</sub>)<sub>2</sub> (x = 0.10; 0.15) Compounds</b> |     |
| M.S. Anikin, E.N. Tarasov, N.V. Kudrevatykh and A.V. Zinin                                                                                            | 247 |
| <b>Monte Carlo Study of the Polycrystalline Ni<sub>2</sub>MnGa Heusler Alloy</b>                                                                      |     |
| O.O. Pavlukhina, V.V. Sokolovskiy and V.D. Buchelnikov                                                                                                | 251 |
| <b>Magnetic Properties of Rapidly Quenched Ribbons of Soft Magnetic Iron-Based Alloys after Annealing in Air and in Vacuum</b>                        |     |
| N.A. Skulkina, O.A. Ivanov, E.A. Stepanova and I.O. Pavlova                                                                                           | 255 |
| <b>Magnetic Properties and Magnetostriction of R<sub>2</sub>Fe<sub>17</sub>H<sub>3±x</sub> (R = Tb, Dy) Hydrides</b>                                  |     |
| I. Tereshina, E.A. Tereshina, M. Doerr, I.A. Pelevin, I.V. Telegina, A.I. Smarzhevskaya and H. Drulis                                                 | 259 |

## Chapter 4: Magnetic Microwires

|                                                                                                                                                                                                                                          |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>High Temperature Properties of CoFe/CoNi and Fe/CoNi Biphase Microwires</b>                                                                                                                                                           |     |
| I. Iglesias, R. El Kammouni, K. Chichay, M. Vazquez and V. Rodionova                                                                                                                                                                     | 265 |
| <b>Manipulation of Magnetic Properties and Domain Wall Dynamics of Amorphous Ferromagnetic Co<sub>68.7</sub>Fe<sub>4</sub>Ni<sub>1</sub>B<sub>13</sub>Si<sub>11</sub>Mo<sub>2.3</sub> Microwire by Changing of Annealing Temperature</b> |     |
| K. Chichay, V. Rodionova, M. Ipatov, V. Zhukova and A. Zhukov                                                                                                                                                                            | 269 |
| <b>Pressure Effects on Transport Properties of (La<sub>0.85</sub>Sr<sub>0.15</sub>)<sub>y</sub>MnO<sub>3</sub> Single Crystals</b>                                                                                                       |     |
| A. Shakin, D. Abashev, D. Shulyatev, R. Privezentsev, N. Andreev and Y. Mukovskii                                                                                                                                                        | 273 |
| <b>Structural and Magnetic Properties of Fe<sub>73.5</sub>Si<sub>13.5</sub>B<sub>9</sub>Nb<sub>3</sub>Cu<sub>1</sub> Microwires Produced by Modernized Ulitovsky-Taylor Method</b>                                                       |     |
| E.E. Shalygina, A.N. Shalygin, A.M. Kharlamova, V.V. Molokanov, T.R. Chueva, P.P. Umnov and N.V. Umnova                                                                                                                                  | 277 |
| <b>Effect of Current Annealing on Domain Wall Dynamics in Bistable FeCoMoB Microwires</b>                                                                                                                                                |     |
| P. Klein, R. Varga, V. Komanicky, G. Badini-Confalonieri and M. Vázquez                                                                                                                                                                  | 281 |
| <b>Influence of the Defects on Magnetic Properties of Glass-Coated Microwires</b>                                                                                                                                                        |     |
| V. Zhukova, E. Shuvaeva, M. Churyukanova, S. Kaloshkin, A. Talaat, M. Ipatov and A. Zhukov                                                                                                                                               | 285 |

## Chapter 5: Magnetic Soft Matter

|                                                                                                                       |     |
|-----------------------------------------------------------------------------------------------------------------------|-----|
| <b>About the Importance of Choosing Bidisperse Approximation for Describing Real-World Polydisperse Ferrofluids</b>   |     |
| E. Novak                                                                                                              | 293 |
| <b>Effects of a Superparamagnetic State of Particles of a Paraffin Based Magnetic Colloid</b>                         |     |
| Y. Dikansky, A. Ispiryan, S. Kunikin and A. Radionov                                                                  | 297 |
| <b>Influence of Rotation on the Magnetization of Dilute Suspensions of Magnetic Particles</b>                         |     |
| A. Tyatyushkin                                                                                                        | 302 |
| <b>Macroproperties of the Magnetic Systems with Anisotropic Microstructural Units</b>                                 |     |
| E. Pyanzina                                                                                                           | 306 |
| <b>Magnetic Properties of Magnetic Hydrogels</b>                                                                      |     |
| L.V. Nikitin, A.A. Gladkov and A.E. Korovushkin                                                                       | 310 |
| <b>Optical Properties of Aggregated Magnetic Fluid: Birefringence and Light Scattering</b>                            |     |
| C.V. Yerin                                                                                                            | 314 |
| <b>Structural Organization in Magnetic Fluids with Magnetized Aggregates in Rotating Magnetic Field</b>               |     |
| D.V. Gladkikh, Y.I. Dikansky and A.A. Kolesnikova                                                                     | 318 |
| <b>Structure Properties in a Bidisperse Ferrofluid in the Absence of an External Magnetic Field</b>                   |     |
| Y.E. Nekhoroshkova and E.A. Elfimova                                                                                  | 323 |
| <b>The Study of the Mobility Coefficient for Chain Aggregates in Quasi-Two-Dimensional Samples of Magnetic Fluids</b> |     |
| A. Muratova                                                                                                           | 327 |
| <b>Thermodynamics of Bidisperse Ferrofluids in Zero External Magnetic Field: Theory and Simulations</b>               |     |
| A.Y. Solovyova and E.A. Elfimova                                                                                      | 331 |

|                                                                                                                    |     |
|--------------------------------------------------------------------------------------------------------------------|-----|
| <b>Magnetic Fluid Bridge between Coaxial Cylinders with a Line Conductor in Case of Wetting</b>                    |     |
| A. Vinogradova, V. Naletova and V. Turkov                                                                          | 335 |
| <b>Heat Transfer in Boiling Magnetic Fluid in a Magnetic Field</b>                                                 |     |
| A.A. Yanovskiy, A.Y. Simonovsky, V.L. Kholopov and I.Y. Chuenkova                                                  | 339 |
| <b>The Influence of a Rotating Magnetic Field on the Sample with Magnetizable Materials near the Vessel Bottom</b> |     |
| D. Pelevina, V. Turkov, S. Kalmykov and V. Naletova                                                                | 343 |

## Chapter 6: Multiferroics

|                                                                                                                                                                                                          |     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Magnetic Field Tunable Electromechanical Resonance Properties of Magnetoelectric Bilayer</b>                                                                                                          |     |
| R.V. Petrov, V.M. Petrov, D.V. Kovalenko, G.A. Semenov and M.I. Bichurin                                                                                                                                 | 349 |
| <b>Magnetoelectric Effect in Ferrite-Piezoelectric Dual-Phase Structure</b>                                                                                                                              |     |
| R.V. Petrov, A.S. Tatarenko, V.M. Petrov and M.I. Bichurin                                                                                                                                               | 353 |
| <b>Temperature Characteristics of Magnetoelectric Effect in Bilayer Ferromagnetic-Piezoelectric Structures</b>                                                                                           |     |
| D. Burdin, D. Chashin, N. Ekonomov and Y. Fetisov                                                                                                                                                        | 357 |
| <b>Magnetic Properties of <math>\text{Pr}_x\text{Y}_{1-x}\text{Fe}_3(\text{BO}_3)_4</math></b>                                                                                                           |     |
| A.I. Pankrats, A.A. Demidov, D.A. Velikanov, V.I. Tugarinov and V.L. Temerov                                                                                                                             | 360 |
| <b>Universal Hysteresis Behavior of Double Perovskite <math>\text{Ba}_{2-x}\text{La}_x\text{FeMoO}_6</math></b>                                                                                          |     |
| D. Handoko, T.T. Dang, D. Nanto, S.C. Yu, S.K. Oh, D.H. Kim, S.E. Demyanov, N.A. Kalanda, D. Handoko, M.V. Yarmolich and L.V. Kovalev                                                                    | 364 |
| <b>Magnetic and Magnetoelectric Properties of <math>\text{Sm}_{1-x}\text{La}_x\text{Fe}_3(\text{BO}_3)_4</math> Single Crystals</b>                                                                      |     |
| E.V. Eremin, N.V. Volkov, I.A. Gudim and V.L. Temerov                                                                                                                                                    | 368 |
| <b>Crystal and Magnetic State of Multiferroic Composites <math>(x)\text{MFe}_2\text{O}_4 + (1-x)\text{BaTiO}_3</math>, <math>\text{M} = \text{Ni, Co}</math></b>                                         |     |
| A.P. Nosov, M.A. Semkin, A.E. Teplykh, S.G. Bogdanov, N.V. Urusova, Y.N. Skryabin, A.N. Pirogov, V.G. Vasiliev, E.V. Vladimirova and T.S. Karpova                                                        | 371 |
| <b>Charge Ordering of Multiferroic <math>\text{LuFe}_2\text{O}_4</math>: Influence of Doping and Electric Field</b>                                                                                      |     |
| D.A. Maslov and Y.B. Kudasov                                                                                                                                                                             | 375 |
| <b>Monte Carlo Modelling of Two Dimensional Multiferroics</b>                                                                                                                                            |     |
| S.J. Lamekhov, I.V. Bychkov, D.A. Kuzmin and V.G. Shavrov                                                                                                                                                | 379 |
| <b>The Correlations between Dynamic Interactions in Antiferromagnetic Multiferroics</b>                                                                                                                  |     |
| M.K. Kharrasov, I.R. Kyzyrgulov, I.F. Sharafullin and A.G. Nugumanov                                                                                                                                     | 383 |
| <b>Effect of Corona Treatment on Magnetic Properties of Nanoscaled Multiferroic Films <math>\text{BiFeO}_3</math>, <math>(\text{BiLa})\text{FeO}_3</math> and <math>(\text{BiNd})\text{FeO}_3</math></b> |     |
| V.G. Kostishyn, N.N. Krupa, L.V. Panina, V.V. Nevdacha, D.N. Chitanov, V.M. Truhan and N.A. Yudanov                                                                                                      | 388 |

## Chapter 7: Spintronics and Magnetotransport

|                                                                                                                                                        |     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Hall Effect Induced by Spin-Wave Excitation in Metal/Ferromagnetic Insulator Bilayer</b>                                                            |     |
| A. Vedyayev, M. Zhuravlev, M. Titova, D. Gusakova and N. Ryzhanova                                                                                     | 395 |
| <b>Spin-Injection Stimulated Radiation of Terahertz Waves in Magnetic Junctions (“Twaser” Action)</b>                                                  |     |
| A.V. Chernych, S.G. Chigarev, Y.V. Gulyaev, G.M. Mikhailov, A.I. Panas, E.A. Vilkov and P.E. Zilberman                                                 | 399 |
| <b>Anomalous Hall Effect in <math>(\text{Co}_{41}\text{Fe}_{39}\text{B}_{20})_x(\text{Al-O})_{100-x}</math> Nanocomposites: Temperature Dependence</b> |     |
| Y.O. Mikhailovsky, V.N. Prudnikov, K.Y. Chernoglazov, V.V. Rylkov, S.N. Nikolaev, A.V. Sitnikov, Y.E. Kalinin, D. Bartov, A. Gerber and A.B. Granovsky | 403 |
| <b>Numerical Simulation of Spin Torque Induced by Spin Hall Effect in CuPt/Fe Heterostructure</b>                                                      |     |
| T. Andrianov, Y. Gritsenko, N. Strelkov, N. Ryzhanova and A. Vedyayev                                                                                  | 407 |

|                                                                                                                                                                                |     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Structural, Magnetic and Electric Transport Properties for <math>\text{Co}_2\text{FeAl}_{0.5}\text{Si}_{0.5}/\text{n-GaAs}</math> Junctions</b>                             | 411 |
| N. Tezuka, T. Saito, M. Matsuura and S. Sugimoto                                                                                                                               |     |
| <b>Simultaneous Localization of Electrons in Different <math>\Delta</math>-Valleys in Ge/Si Quantum Dot Structures</b>                                                         | 415 |
| A. Zinovieva, N. Stepina, A.V. Dvurechenskii, L. Kulik, G. Mussler, J. Moers and D. Grützmacher                                                                                |     |
| <b>Magnetoresistance and Magnetic Properties <math>\text{Ce}_x\text{Mn}_{1-x}\text{S}</math></b>                                                                               | 419 |
| S.S. Aplesnin, M.N. Sitnikov, O.B. Romanova, E.V. Eremin, V.V. Sokolov and A.Y. Pichugin                                                                                       |     |
| <b>Magnetic and Magnetoresistance Properties of <math>(\text{Co/Ge})_n</math> Films</b>                                                                                        | 423 |
| G. Patrin, I. Turpanov, E. Maruschenko, K. Patrin, A. Kobayakov, V. Maltsev and V. Yushkov                                                                                     |     |
| <b>Enhancement of Exchange Bias in NiFe/IrM, IrMn/NiFe and NiFe/IrMn/NiFe Structures with Different Thickness of Antiferromagnetic Layer</b>                                   | 427 |
| V. Rodionova, I. Dzhun, K. Chichay, S. Shevyrtaiov and N. Chechenin                                                                                                            |     |
| <b>Bifurcations in the Dynamical System for Three-Layered Magnetic Valve</b>                                                                                                   | 431 |
| N. Ostrovskaya, V. Skidanov and I. Iusipova                                                                                                                                    |     |
| <b>Peculiarity of Solitary Deflection Waves Dynamics on the Domain Walls of Yttrium Orthoferrite</b>                                                                           | 435 |
| M.V. Chetkin, Y.N. Kurbatova and T.B. Shapaeva                                                                                                                                 |     |
| <b>Ferromagnetic State of <math>\text{LaMnO}_3</math> Interlayer in <math>\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3/\text{LaMnO}_3/\text{SrRuO}_3</math> Heterostructures</b> | 439 |
| A.M. Petrzlik, Y.N. Khaydukov, L. Mustafa, V.V. Demidov and G.A. Ovsyannikov                                                                                                   |     |
| <b>The Influence of the Magnetic Field on Electrically Induced Domain Wall Motion</b>                                                                                          | 443 |
| D.A. Sechin, E.P. Nikolaeva, A.P. Pyatakov, A.B. Nikolaev and T.B. Kosykh                                                                                                      |     |
| <b>Peculiarities of Transport, Resonance and Optical Properties of the Anion-Substituted Manganese Chalcogenides</b>                                                           | 447 |
| O.B. Romanova, S.S. Aplesnin, A.M. Vorotynov, G.I. Makovetskii, O.F. Demidenko and K.I. Yanushkevich                                                                           |     |
| <b>The Bias-Controlled Magnetoimpedance Effect in a MIS Structure</b>                                                                                                          | 451 |
| D.A. Smolyakov, A.S. Tarasov, A.O. Gustaitsev and N.V. Volkov                                                                                                                  |     |
| <b>Anomalous Galvanomagnetic Effects due to Spontaneous Spin Polarization of Electrons in Crystal with Low Concentration of 3d-Transition Element Impurities</b>               | 456 |
| A.T. Lonchakov, V.I. Okulov, E.A. Pamyatnykh, T.E. Govorkova, M.A. Andriichuk, L.D. Paranchich, S.B. Bobin and V.V. Deryushkin                                                 |     |

## Chapter 8: High Frequency Properties

|                                                                                                                                                                                                                                                                    |     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Bias Current Effect on Second Harmonic in Asymmetric Magnetoimpedance Response in Amorphous Microwires</b>                                                                                                                                                      | 463 |
| N.A. Buznikov, A.S. Antonov and A.B. Granovsky                                                                                                                                                                                                                     |     |
| <b>High-Frequency Properties of Multilayer Systems Based on the <math>(\text{Co}_{41}\text{Fe}_{39}\text{B}_{20})_x(\text{SiO}_2)_{100-x}</math> and <math>(\text{Co}_{45}\text{Fe}_{45}\text{Zr}_{10})_x(\text{Al}_2\text{O}_3)_{100-x}</math> Nanocomposites</b> | 467 |
| H. Al Azzawi, Y. Kalinin, A. Sitnikov and O. Tarasova                                                                                                                                                                                                              |     |
| <b>Investigation of Nonlinear Dynamics of Magnetoelastic Oscillations in Normal Magnetized Ferrite Plate</b>                                                                                                                                                       | 471 |
| D. Pleshev, V.S. Vlasov, L.N. Kotov, F.F. Asadullin, S.M. Polesnikov, V.G. Shavrov and V.I. Shcheglov                                                                                                                                                              |     |
| <b>Microwave Magnetic Induction Structure of the Surface Spin Wave in Ferrite Film</b>                                                                                                                                                                             | 476 |
| E.H. Lock                                                                                                                                                                                                                                                          |     |
| <b>Hypersound Excitation in the Ferrite Plate by Impulse Magnetization Reversal</b>                                                                                                                                                                                | 480 |
| V.S. Vlasov, D. Pleshev, L.N. Kotov, V.G. Shavrov, V.I. Shcheglov, F.F. Asadullin and S.M. Polesnikov                                                                                                                                                              |     |
| <b>Concentration Dependences of Exchange Fields in Composite and Multilayer Thin Films</b>                                                                                                                                                                         | 485 |
| A.V. Golov, L.N. Kotov, V.S. Vlasov, F.F. Asadullin, Y.E. Kalinin and A.V. Sitnikov                                                                                                                                                                                |     |
| <b>Study of the Torque Acting on the Magnetization during <math>90^\circ</math> Pulsed Reversal Process in Ferrite-Garnet Films with In-Plane Anisotropy</b>                                                                                                       | 490 |
| O.S. Kolotov, A.V. Matyunin, G.M. Nikoladze and P.A. Polyakov                                                                                                                                                                                                      |     |

## Chapter 9: Nanostructures and Low Dimensional Magnetism

|                                                                                                                                                                                                                                  |     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>AC Magnetic Susceptibility Study in Co/Au Nanoparticles</b><br>P. Hrubovčák, A. Zelenáková, V. Želeňák and J. Michalíková                                                                                                     | 497 |
| <b>Anisotropic Magnetoresistance and Weak Localization in Granular System Ni-MgO</b><br>A. Grebennikov and O. Stognei                                                                                                            | 501 |
| <b>Peculiarities of the Interface Forming in the “Nanocomposite-Bismuth Telluride” Multilayer System</b><br>G.S. Zykov, E.A. Gan'shina, A.I. Novikov, Y.E. Kalinin and A.V. Sitnikov                                             | 505 |
| <b>Room Temperature Instability of Exchange Anisotropy in FeMn/FeCo System</b><br>E. Jiménez, N. Mikuszeit, D.R. Cavicchia, L. Rossi and F. D'Orazio                                                                             | 509 |
| <b>Surface Modified Ni Nanoparticles Produced by the Electrical Explosion of Wire</b><br>A.P. Safronov, G.V. Kurlyandskaya, S.M. Bhagat, I.V. Beketov, A.M. Murzakaev, I. Orue and A. Larrañaga                                  | 513 |
| <b>Unidirectional Anisotropy in Nanostructures with Antiferromagnetic NiFeMn Layer</b><br>I.V. Blinov, T.P. Krinitsina, M.A. Milyaev, V.V. Popov and V.V. Ustinov                                                                | 517 |
| <b>Temperature Behavior of Magnetization in Multiphase Co-P Powders in Unsaturated Regime</b><br>O.Á. Li, S.V. Komogortsev, R.S. Iskhakov, L.A. Chekanova and E.V. Eremin                                                        | 522 |
| <b>Spectral Ellipsometry of Cobalt-Ions Implanted Silicon Surface</b><br>V.V. Bazarov, V.F. Valeev, V.I. Nuzhdin, Y.N. Osin, G.G. Gumarov and A.L. Stepanov                                                                      | 526 |
| <b>Oxygen Effect on Magnetic Anisotropy Energy of Co Nanowires on Cu(210) Surface - An <i>Ab Initio</i> Study</b><br>J. Korobova, D. Bazhanov and I. Kamynina                                                                    | 530 |
| <b>New Iron(II) Complexes [Fe(HC(Pz)<sub>3</sub>)<sub>2</sub>]<sub>2</sub>A<sub>2</sub> with Spin-Crossover</b><br>O.G. Shakirova, N.V. Kuratieva, E.V. Korotaev and L.G. Lavrenova                                              | 534 |
| <b>Magnetic Properties of Nanocomposites Metal-Carbon</b><br>A. Aleshnikov, H.S.M. Al-Azzawi, Y. Kalinin, A. Sitnikov and O. Tarasova                                                                                            | 538 |
| <b>Magnetic Resonance in CuCr<sub>2</sub>S<sub>4</sub> Nanoclusters and Nanocrystals</b><br>A. Pankrats, A. Vorotynov, V. Tugarinov, S. Zharkov, G. Abramova, G. Zeer, K. Ramasamy and A. Gupta                                  | 542 |
| <b><i>Ab Initio</i> Study of the Oxygen Effect on Magnetic Interactions within 3d Metal Nanowires on Vicinal Rh (553) Surface</b><br>I. Kamynina, D. Bazhanov and J. Korobova                                                    | 546 |
| <b>Anisotropy in FeCo Nanoparticles, a First Step</b><br>G. Khadra, A. Tamion, F. Tornus, B. Canut and V. Dupuis                                                                                                                 | 550 |
| <b>Dependence of the Hysteresis Characteristics of Co-Au Core-Shell Nanoparticles on the Size of the Particles</b><br>M.A. Chernova, L.L. Afremov and I.G. Iliushin                                                              | 554 |
| <b>Easy Axis Spin-Flop in <math>\epsilon</math>-Phase In-Doped Iron (III) Oxide Nanowires</b><br>A.I. Dmitriev, O.V. Koplak, A. Namai, H. Tokoro, S. Ohkoshi and R.B. Morgunov                                                   | 558 |
| <b>Electronic Properties and Stability of Silicon Nanoclusters Passivated by Hydrogen</b><br>V. Baturin, S. Lepeshkin, N. Matsko and Y. Uspenskii                                                                                | 562 |
| <b>FMR and Magnetic Properties of (CoFeB)<sub>m</sub>(SiO<sub>2</sub>)<sub>100-m</sub> Nanocomposite</b><br>S. Vyzulin, N. Syr'ev and M. Shlapakov                                                                               | 567 |
| <b>Fourfold Magnetic Anisotropy of CoPd Alloy, Obtained by Solid State Reactions in Epitaxial Pd/hcp-Co and Pd/fcc-Co Bilayers</b><br>V.G. Myagkov, L.E. Bykova, V.S. Zhigalov, I.A. Tambasov, G.N. Bondarenko and A.A. Matsynin | 571 |
| <b>Free-Standing 2D Silicon Nanocrystals Stabilized with Perfluorophenyl Ligands: Experiment and <i>Ab Initio</i> Research</b><br>L. Aslanov, I. Kudryavtsev, V. Zakharov, E. Kulatov and Y. Uspenskii                           | 575 |
| <b>Magnetic and Magnetotransport Properties of Fe-NbO System</b><br>A. Grebennikov, O. Stognei, K. Semenenko and T. Tregubova                                                                                                    | 579 |

|                                                                                                                                                                                                                                                                                                                                   |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Magnetic Anisotropy of Co-Nanostructures Embedded in Matrices with Different Pores Size and Morphology</b><br>E.A. Denisova, L. Chekanova, R. Iskhakov, S. Komogortsev, I. Nemtsev, D. Velikanov and S. Mel'nikova                                                                                                             | 583 |
| <b>Magnetic Clusters in Natural Ferro-Chromian Spinels</b><br>T. Sherendo, V. Mitrofanov, A. Vdovin, P. Martyshko, A. Alexeev, D. Zamyatin, V. Vazhenin and L. Pamyatnykh                                                                                                                                                         | 587 |
| <b>Structure and Magnetic Properties of FeNi/Ti Multilayered Films Grown by Magnetron Sputtering</b><br>A.V. Svalov, V.O. Vas'kovskiy, A. Larrañaga and G.V. Kurlyandskaya                                                                                                                                                        | 591 |
| <b>Optical Second Harmonic Generation in Nanostructures with Inhomogeneous Magnetization</b><br>I.A. Kolmychek, V.L. Krutyanskiy, T. Murzina, E.A. Karashtin, M.V. Sapozhnikov and A.A. Fraerman                                                                                                                                  | 595 |
| <b>Magnetic and Magneto-Optical Properties of Magnetoplasmonic Crystals</b><br>V. Belyaev, A. Grunin, A. Fedyanin and V. Rodionova                                                                                                                                                                                                | 599 |
| <b>Magneto-Optical Properties of Multilayer Nanostructures with Composite Magnetic Layers near Percolation Threshold</b><br>V. Buravtsova, E. Gan'shina, Y. Kalinin, A. Sitnikov and D. Zubakin                                                                                                                                   | 603 |
| <b>Magnetodeformational Anisotropy of FeGa/PU Hybrid Nanocomposite via Particle Concentration and Spatial Orientation</b><br>T.Y. Kiseleva, S.I. Zholudev, A.A. Novakova, T.S. Gendler, I.A. Il'inykh, A.I. Smarzhevskaya, Y. Anufriev and T.F. Grigorieva                                                                        | 607 |
| <b>Nanocrystalline Soft Magnetic (Fe<sub>0.7</sub>Co<sub>0.3</sub>)<sub>88</sub>Hf<sub>2</sub>W<sub>2</sub>Mo<sub>2</sub>Zr<sub>1</sub>B<sub>4</sub>Cu<sub>1</sub> Alloy with Enhanced Thermal Stability of Magnetic Properties</b><br>V.A. Lukshina, N.V. Dmitrieva, E.G. Volkova, A.P. Potapov, B.N. Filippov and D.A. Shishkin | 611 |
| <b>A New Method of Intergrain Exchange Interaction Energy Determination in Nanostructured Alloys with Spontaneous Spin-Reorientation Transition</b><br>A.S. Volegov, A.S. Bolyachkin and N.V. Kudrevatykh                                                                                                                         | 615 |
| <b>Components of Magnetic Anisotropy of Soft Magnetic Nanocrystalline Fe-Based Films</b><br>E.V. Harin and E.N. Sheftel                                                                                                                                                                                                           | 619 |
| <b>Effect of Secondary Decomposition on Coercivity of Fe-Co-Cr Alloys with 15% Co</b><br>V.P. Menushenkov and V.S. Shubakov                                                                                                                                                                                                       | 623 |
| <b>The Suppression of Demagnetizing Field Heterogeneity in Ferromagnetic Powders</b><br>R. Yaroslavtsev, S. Komogortsev, L. Chekanova, L. Kuzovnikova, E.A. Denisova, O. Li, D. Velikanov and R. Iskhakov                                                                                                                         | 629 |
| <b>Magnetic and Magnetoiresonance Studies of Composite Multilayer Films with Different Kinds of Interlayers</b><br>I. Shipkova, J. Chekrygina, A. Devizenko, E. Lebedeva, N. Syr'ev and S. Vyzulin                                                                                                                                | 633 |

## Chapter 10: Magnetic Thin Films

|                                                                                                                                                                                                                                   |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Influence of the Size Effect on Magnetic Susceptibility in Ultrathin Films</b><br>L.L. Afremov and A.A. Petrov                                                                                                                 | 639 |
| <b>Spin Filtering on the MnSb Cluster Interface in GaSbMn Thin Films</b><br>O. Koplak, A. Polyakov, A. Davydov, R. Morgunov, A. Talantsev, A. Kochura, I. Fedorchenko, O. Novodvorskiy, L. Parshina, B. Aronzon and E. Lähderanta | 643 |
| <b>Magnetic Properties of Co-B Nanostructures Prepared via Electroless Deposition</b><br>D. Richardson and F.M.F. Rhen                                                                                                            | 648 |
| <b>The Influence of Si on Magnetic and Magneto-Optical Properties of Co/Si/Co Thin-Film Systems</b><br>E.E. Shalygina, E.A. Gan'shina, A.M. Kharlamova, A.N. Mukhin, G.V. Kurlyandskaya and A.V. Svalov                           | 653 |
| <b>Surface Modification of Thin Iron Films in Aromatic Solvents at Ambient Conditions</b><br>A.A. Chlenova, G.V. Kurlyandskaya, A.P. Safronov, A. Larrañaga, S. Fernandez Armas, I. Zalbidea Arechaga and V.N. Lepalovskiy        | 657 |
| <b>A Simple Model for Investigation of the Pair Breaking Effect on the Parameters of HTS/FM Thin Films</b><br>T. Nurgaliev and L. Uspenskaya                                                                                      | 662 |

|                                                                                                                                                                                                                                                                                                   |     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Structural and Magnetic Properties of <math>\text{Ni}_{50}\text{Mn}_{35}\text{In}_{15}</math> Thin Films</b><br>S. Granovsky, I. Gaidukova, A. Sokolov, A. Devishvili and V. Snegirev                                                                                                          | 666 |
| <b>Structural and Transport Properties of <math>\text{Ni}_{45}\text{Mn}_{40}\text{In}_{15}</math> Thin Films</b><br>M.V. Lyange, M.V. Gorshenkov, A.V. Bogach, M. Ohtsuka, H. Miki, T. Takagi and V.V. Khovaylo                                                                                   | 670 |
| <b>Temperature Dependent Magnetic and Structural Properties of <math>\text{Co}_2(\text{Fe}, \text{Ti})\text{Ga}</math> Thin Films</b><br>V. Rodionova, S. Shevyrtalov, K. Chichay, A. Okubo, R. Kainuma, R.Y. Umetsu, M. Ohtsuka, A. Bozhko, V. Golub, M. Gorshenkov, M. Lyange and V.V. Khovaylo | 674 |
| <b>Surface Properties of Nanoscale Iron Garnet Films</b><br>T.B. Kosykh, A.S. Prosyakov, A.P. Pyatakov, A.N. Shaposhnikov, A.R. Prokopov and I.V. Sharay                                                                                                                                          | 678 |
| <b>Ferromagnetic and Spin-Wave Resonance in <math>\text{Fe}_x\text{Ni}_{1-x}</math> (0</b><br>I.G. Vazhenina, R.S. Iskhakov, L.A. Chekanova, S.V. Stolyar and V.Y. Yakovchuk                                                                                                                      | 682 |
| <b>Morphology and Magnetic Properties of Amorphous Co-P and Co-Ni-P Films</b><br>A.V. Chzhan, V.A. Seredkin, G.S. Patrin, V.N. Zabluda, Y.V. Zubavichus, Y.L. Mikhlin and R.Y. Rudenko                                                                                                            | 686 |
| <b>Magnetization Processes Study in the Implanted Garnet Films Using the Second-Harmonic Generation Effect</b><br>A. Bonda, S. Uba and L. Uba                                                                                                                                                     | 690 |
| <b>Thermoelectric Power of Gradient <math>\text{Fe}_x(\text{Al}_2\text{O}_3)_{100-x}</math> Composite Films</b><br>O. Stognei, A. Al-Maliki, A. Sitnikov and V. Makagonov                                                                                                                         | 694 |
| <b>Influence of Annealing on the Surface Topography and Magnetic Properties of Thin Films of the FINEMET-Type Alloy</b><br>E. Mikhailitsyna, V. Kataev, P. Geydt, V. Lepalovsky and E. Lähderanta                                                                                                 | 699 |
| <b>Magnetic Properties of NiFe and FeCuNbSiB Thin Films: Effect of Thickness on Static Permeability</b><br>J. Moulin, I. Shahosseini, M. Woytasik, T.H.N. Dinh and O. Garel                                                                                                                       | 705 |
| <b>Structural and Magnetic Properties of Annealed Vapor Deposited <math>\text{Co}_x\text{Cr}_{1-x}</math> Thin Films</b><br>A. Kharmouche                                                                                                                                                         | 709 |
| <b>Effect of Co Doping on the Galvanomagnetic Properties of ZnO Thin Films</b><br>V.G. Kytin, O.V. Reukova, D.D. Melnik, L.I. Burova, A.R. Kaul and V.A. Kulbachinskii                                                                                                                            | 713 |
| <b>Magnetic Properties of Amorphous Hydrogenated Carbon Thin Films Doped by Ni</b><br>I.G. Lukitsa, G.A. Nikolaychuk, O.Y. Moroz and V.M. Smirnov                                                                                                                                                 | 717 |

## Chapter 11: Magnetism and Superconductivity

|                                                                                                                                                                                                                                                                 |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>On the Superconductivity of Planar Carbon Compounds</b><br>R. Zaitsev                                                                                                                                                                                        | 725 |
| <b>Anomalous Temperature Dependence of the Upper Critical Magnetic Field in Electron-Doped High-Temperature Superconductor</b><br>T.B. Charikova, N.G. Shelushinina, G.I. Harus, V.N. Neverov, D.S. Petukhov, O.E. Petukhova and A.A. Ivanov                    | 729 |
| <b>Copper Oxide Superconducting/Antiferromagnetic Interface</b><br>Y. Kislinskii, K. Constantinian, G. Ovsyannikov, A. Shadrin, I. Borisenko, Y. Khaydukov, A. Sheyerman and A. Vasiliev                                                                        | 733 |
| <b>Current-Phase Relation of Superconductor-Ferromagnet-Superconductor Junctions with a Composite Interlayer</b><br>A. Sheyerman, G. Ovsyannikov, Y. Kislinskii, K. Constantinian and A. Shadrin                                                                | 737 |
| <b>Magnetic Prehistory in the Heat Capacity of the Low-Temperature Superconductors</b><br>S.M. Podgornykh                                                                                                                                                       | 741 |
| <b>Role of Interface Transparency and Exchange Field in the Superconducting Triplet Spin-Valve Effect</b><br>R.G. Deminov, L.R. Tagirov, R.R. Gaifullin, Y.V. Fominov, T.Y. Karminskaya, M.Y. Kupriyanov and A.A. Golubov                                       | 745 |
| <b>Observation of Pinning Strengthening in “<math>\text{MgB}_2 - \text{CNT} - \alpha\text{-Fe}</math>” Nanocomposites Studied by Microwave Absorption Technique</b><br>V.V. Bazarov, P.N. Togulev, F.A. Nizamov, N.M. Lyadov, S.N. Ivicheva and N.M. Suleimanov | 750 |

## Chapter 12: Magnetism in Biology and Medicine

### **Combined Photodynamic Thermochemotherapy of Glial Tumors Controlled by MRI and Electronic Sensor**

N.A. Brusentsov, V.A. Polianskiy, A.V. Zhukov, M.V. Gulyaev, M.P. Nikitin, P.I. Nikitin, T.N. Brusentsova, V.D. Kuznetsov, O.A. Bocharova and A.Y. Baryshnikov

757

### **Heating of Zn-Substituted Manganese Ferrite Magnetic Nanoparticles in Alternating Magnetic Field**

T.M. Elkhova, A.K. Yakushechkina, A.S. Semisalova, Y.K. Gun'ko, Y.I. Spichkin, A.P. Pyatakov, K.I. Kamilov, N.S. Perov and A.M. Tishin

761

### **Mossbauer Study of Microbial Synthesis of Iron-Containing Nanoparticles**

A.A. Shapkin, N.I. Chistyakova, D.G. Zavarzina, T.N. Zhilina and V.S. Rusakov

766

### **To the Theory of Hyperthermia Effect Induced by Magnetic Nanoparticles**

A. Zubarev and A. Abu-Bakr

771