

Curriculum Vitae  
Aleksandr Petrov

**Citizenship:**

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**Date of Birth:**

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**Place of birth:**

...

**Address:**

Istituto Officina dei Materiali del CNR, Laboratorio TASC, Area Science Park  
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**Spoken Languages:**

Russian, English, Italian.

**EDUCATION**

**Ph.D. in Physics**

**2 March 2001**

*Institute of the Solid State Physics and Semiconductors, Belarus National Academy of Sciences. Title of the Thesis: "Structure symmetry, static disorder and their influence on the vortex lattice in anisotropic superconductors". Thesis advisor – prof. Prischepa S.L.*

**Master degree in Solid State Physics**

**23 June 1995**

*Belarus State University, Radiophysics and Electronics Department. Title of the Thesis: "Transformation of Secondary Defects in Silicon during processing in hydrogen plasma." 23 may 1995 with mark 5 (fine) (equipollenza MIUR protocollo 327 del 29/03/2011).*

**PROFESSIONAL POSITIONS**

**September 2013 – current:** Post-doctoral fellowship, Research associate (non-permanent position) at the Consiglio Nazionale delle Ricerche, Istituto per l'Officina dei materiali (IOM), Laboratory TASC, Trieste, NFFA project headed by prof. G.Rossi.

Responsibilities: responsible of the Oxide Molecular Beam Epitaxy (MBE) and X-ray Diffraction and Reflectivity (XRD) Laboratories.

Research interests: growth and investigation of new materials and physical properties of oxide films and heterostructures grown by reactive MBE, and their application in novel devices; methods of in-situ advanced analysis of growth by Reflection High Energy Electron Diffraction (RHEED).

Current research includes:

- Thin films, multilayers and superlattices growth by ozone assisted MBE, including users support in framework of NFFA project.
- Development of in-situ surface's analysis method based on RHEED rocking curve measurements.

- Perovskites films and multilayers growth with engineered surface/interface based on RHEED rocking curve analysis for investigation of processes on the boundary separation.
- Structural, magnetic, ferroelectric and transport properties films and its surfaces characterization by means of X-ray Diffraction (XRD), four probes resistivity measurements, atomic force microscopy (AFM) and magneto-optical Kerr effect (MOKE).
- Research of polarization induced ferromagnetic state changes in ferroelectric-ferromagnetic interfaces ( $\text{BaTiO}_3/\text{La}_{1-x}\text{Ba}_x\text{MnO}_3$ ).
- Studies of phases separation in annealed  $\text{La}_{1-x}\text{Ca}_x\text{MnO}_3$  films grown on  $\text{NdGaO}_3(001)$  substrates.
- Development of methods for in-situ control on crystalline structure relaxation of films during sample growth on the substrates with big mismatch.
- Investigation of magnetic and transport properties' anisotropy in thin single manganite films under symmetrical or asymmetrical tensile and compressive strain.
- Studies of magnetic properties in ferromagnetic and antiferromagnetic manganites ( $\text{La}_{1-x}\text{B}_x\text{MnO}_3$  ;  $\text{B}=\text{Ca, Sr, Ba}$ ) single films with X-ray absorption spectroscopy (x-ray magnetic circular dichroism), resonant magnetic scattering (XRMS) and photoelectron emission spectroscopy (PEEM) at of Elettra (APE, BEAR beamlines) and Diamond Light Sources.
- Ferroelectric-ferromagnetic structures ( $\text{BaTiO}_3/\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$ ) and MOKE microscopy characterization during short term scientific mission in University of Tübingen, financed by TO-BE Action (April 2015). Film growth and devices preparation by optical lithography. Designed and produced circuit drawings and masks (CAD-based) for this projects.
- Atomic Absorption Spectroscopy technique projecting as a fast and reliable way for single evaporated element's flux control during growth.
- High temperature (up to temperature of crystals' growth, near 800C) 5 degrees of freedom manipulator design and construction for MBE chamber.
- Design of techniques for ferroelectric polarization measurements of thin films and devices.

**December 2006 – August 2013:** Post-doctoral fellowship, Research associate (non-permanent position) at the Consiglio Nazionale delle Ricerche, Istituto per l'Officina dei materiali (IOM), Laboratory TASC, Trieste, in group headed by dott. B.Davidson.

Research interests: growth and investigation of new materials and physical properties of oxide films and heterostructures grown by reactive MBE, and their application in novel devices; methods of in-situ advanced analysis of growth by RHEED.

- Thin films, multilayers and superlattices growth by ozone assisted MBE.
- Adoption and development of atomic layer-shuttered method pioneered by D.Schlom group for stoichiometric growth of perovskite compounds. This method permits to deposit consequently atomic layers by atomic layer, repeating natural crystallographic structure of perovskite (for some crystallographic directions). At the same time method permits to control

stoichiometry in real-time regime by the means of RHEED analysis, and, if necessary, to adjust stoichiometry immediately.

- Designed and constructed ozone accumulation equipment to obtain a highest oxidation reactive atmosphere for optimal oxidation of materials.
- Designed and constructed four-probe resistivity measurements system for thin films in temperature range 4-450K;
- Characterization of thin films, multilayers and superlattices by XRD, AFM Rutherford Backscattering spectroscopy (RBS) and four-probes resistivity measurements.
- Investigation of magnetic and transport properties of “dead” layers in thin single manganite films ( $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$ ), in manganites based tunnelling junctions ( $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3/\text{SrTiO}_3/\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$ ), magnetic properties of exchange bias bilayers ( $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$ ,  $\text{LaFeO}_3$ ).
- Participation in research project on magnetic profiles measurements in ferromagnetic thin films of  $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$  by means of  $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$  and surface diffraction with atomic position refinement at facility of Elettra Light Source (BEAR and ALOISA beamlines).

**January 2002 – November 2006:** Research associate of Physics Department “E.R. Caianiello” of Salerno University, Italy in the group headed by prof. L.Maritato.

- Growth of perovskite structure of manganites ( $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$ ) in MBE (Riber) by co-deposition methods (simultaneous deposition of all materials with the fluxes corresponding to desired stoichiometry) in the atmosphere of ozone and oxygen mixture.
- Stoichiometry calibration by quartz crystal monitor and measurements by Scanning Electron Microscopy (SEM) equipped with Energy Dispersive Spectroscopy technique.
- Studies of optimal conditions for two dimensional epitaxial growth of manganites films on on substrates with various mismatch.
- Software development for RHEED pattern analysis in real-time regime for growth speed calibration by analysis of RHEED specular spot intensity.
- Characterization of transport and crystallographic properties of manganites thin films by four probe method in van der Pauw configuration and XRD.
- Research activity was dedicated to oxide thin films formation by the means of Molecular Beam Epitaxy (MBE) and to study of strain, induced by substrate and structure inhomogeneity, as oxygen vacancies, and it influence on transport and magnetic properties of manganites films.

**September 2001 – December 2001** Associate professor, Networks and Telecommunication devices Department, Belarusian State University of Informatics and Radioelectronics, Minsk

**January 2000 – August 2001** Assistant of Telecommunication Systems Department, Higher College of Communications, Minsk.

**November 1996 – December 1999** Post Graduate Student, Junior Scientific Researcher of Belarus State University of Informatics and Radioelectronics, Minsk.

- Theoretical investigation of superconducting properties of different thin film materials and thin film microstructures
- Studies of vortex lattice dynamics in high-temperature superconductors thin films at temperatures and magnetic fields near critical and in multilayer

- structure symmetry influence on their characteristics in external magnetic fields in framework of Takahashi-Tashiki theory.
- Programming software (Mathematica) for superconducting order parameter calculation for vortex lattice in superconducting superlattices with different symmetry.

### TEACHING COURSES:

- Theory of telecommunication (*The Belarusian State Academy of Telecommunications, The Belarusian State University of Informatics and Radioelectronics; September 2000 – December 2001*);
- Powering of telecommunication devices (*The Belarusian State Academy of Telecommunications; September 2000-May 2001*).

### PAST AND CURRENT SCIENTIFIC INTERESTS

- Growth and in-situ analysis techniques for Molecular Beam Epitaxy (current).
- Surface's advanced analysis with RHEED (current)
- Exchange bias effect in oxide's antiferromagnetic/ferromagnetic bilayers (current).
- Studies of interface effects in multilayers with ferroic/multiferroic materials (ferroelectric, ferromagnetic, piezoelectric) (current).
- Physics of magnetic oxide perovskite material thin films (current).
- Tunnel junctions based on half-doped manganites.
- Flux dynamics in thin superconducting films.
- Pinning and magnetic properties of layered superconducting structures.
- Influence of hydrogen plasma on evolution defects in semiconductors.

### TECHNICAL SKILLS

Experienced with programming in LabView (four probe transport measurements and atomic absorption measurements programs), Visual Basic (program for RHEED pattern intensities analysis in real-time regime), Mathematica (programs for superconducting order parameter calculation in multilayer superconductor/metal), Origin (data analysis and presentation). Experienced also with software like Gwyddion (AFM analysis), X'Pert Epitaxy (X-ray diffraction data analysis).

### CONFERENCES AND SCHOOL PARTECIPATION

1. 2<sup>nd</sup> NFFA-Europe Summer School, Trieste 9-13 July 2018 invited lecturer: Metal oxides MBE.
2. FisMat, Trieste, 1-5 October 2017. Poster contribution: Transport properties and polarization effect in ferromagnetic-ferroelectric bilayers using manganite thin films.
3. FOxE – Functional Oxides for Electronics, Massa Lubrense, Napoli, 25-27 March 2009. Oral contribution: Growth and transport properties of engineered manganite "dead" layers.
4. 2nd European School on Multiferroics, Gerona, 1-5 September 2008
5. 6th THIOX Topical Meeting, Sestri Levante, Genova, 9-11 April 2008. Poster contribution: Extending of quantitative RHEED techniques for oxide heteroepitaxy

6. 5th THIOX Topical Meeting, Sant Feliu de Guixol, Barcelona, 28-30 March 2007. Poster contribution: Atomic layer-by-layer engineering of epitaxial oxide heterostructures by MBE
7. *International school of physics “Enrico Fermi” From nanostructures to nanosensing applications*. July 2004, Varenna (Italy).
8. *International Conference on Magnetism, Rome, July 27 - August 1, 2003*. Oral contribution: High metal – insulator transition temperature in  $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$  thin films grown in low oxygen partial pressure by Molecular Beam Epitaxy.

## LIST OF SCIENTIFIC PUBLICATIONS IN REFEREED JOURNALS

1. *Investigating the Intrinsic Anisotropy of  $\text{VO}_2(101)$  Thin Films Using Linearly Polarized Resonant Photoemission Spectroscopy* Alessandro D’Elia, Vincent Polewczyk, Aleksandr Yu. Petrov, Liang Li, Chongwen Zou, Javad Rezvani and Augusto Marcelli *Condens. Matter* 2023, 8, 40. (doi.org/10.3390/condmat8020040)
2. *Chemical, structural and electronic properties of ultrathin  $\text{V}_2\text{O}_3$  films on  $\text{Al}_2\text{O}_3$  substrate: Implications in Mott-like transitions*. Polewczyk, S.K.Chaluvadi, D.Dagur, F.Mazzola, S.Punathum Chalil, A.Yu.Petrov, J.Fujii, G.Panaccione, G.Rossi, P.Orgiani, G.Vinai, P.Torelli *Appl. Surface Science* 610, 155462 (2023).
3. *Visible Light Effects on Photostrictive/Magnetostrictive PMN-PT/Ni Heterostructure* D.Dagur, V.Polewczyk, A.Yu.Petrov, P.Carrara, M.Brioschi, S.Fiori, R.Cucini, G.Rossi, G.Panaccione, P.Torelli, G.Vinai *Adv. Material Interfaces* 9, 36, 2201337 (2022)
4. *Electronic Properties of Fully Strained  $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$  Thin Films Grown by Molecular Beam Epitaxy ( $0.15 \leq x \leq 0.45$ )* S.K.Chaluvadi, V.Polewczyk, A.Yu.Petrov, G.Vinai, L.Braglia, J.M.Diez, V.Pierron, P.Perna, L.Mechin, P.Torelli, and P.Orgiani *ACS Omega* 7, 17, 14571 (2022)
5. *Identification of hidden orbital contributions in the  $\text{La}_{0.65}\text{Sr}_{0.35}\text{MnO}_3$  valence band* F. Offi, K. Yamauchi, S. Picozzi, V. Lollobrigida, A. Verna, C. Schlueter, T.-L. Lee, A. Regoutz, D. J. Payne, A. Petrov, G. Vinai, G. M. Pierantozzi, T. Pincelli, G. Panaccione, and F. Borgatti *Phys. Rev. Materials* **5**, 104403 (2021)
6. *Evidence of Robust Half-Metallicity in Strained Manganite Films* G.M.Pierantozzi, G.Vinai, A.Yu.Petrov, A.De Vita, F.Motti, V.Polewczyk, D.Mondal, T.Pincelli, R.Cucini, C.Biggi, I.Vobornik, J.Fujii, P.Torelli, F.Offi, G.Rossi, G.Panaccione, and F.Borgatti *J. Phys. Chem. C*, **125**, 26, 14430–14437 (2021)
7. *An integrated ultra-high vacuum apparatus for growth and in situ characterization of complex materials* G. Vinai, F. Motti, A. Yu. Petrov, V. Polewczyk, V. Bonanni, R. Edla, B. Gobaut, J. Fujii, F. Suran, D. Benedetti, F. Salvador, A. Fondacaro, G. Rossi, G. Panaccione, B. A. Davidson, and P. Torelli *Review of Scientific Instruments* **91**, 085109 (2020)
8. *Transparent conductive oxide-based architectures for the electrical modulation of the optical response: A spectroscopic ellipsometry study* Sygletou, M., Bisio, F., Benedetti, S., Torelli P., De Bona A., Petrov, A., Canepa, M *Journal of Vacuum Science and Technology B: Nanotechnology and Microelectronics*, **37(6)**, 061209 (2019)
9. *Transient quantum isolation and critical behavior in the magnetization dynamics of half-metallic manganites* T. Pincelli, R. Cucini, A. Verna, F. Borgatti, M. Oura, K. Tamasaku, H. Osawa, T.-L. Lee, C. Schlueter, S. Günther, C. H. Back, M. Dell’Angela, R. Ciprian, P. Orgiani, A. Petrov, F. Sirotti, V. A. Dediu, I. Bergenti, P.

- Graziosi, F. Miletto Granozio, Y. Tanaka, M. Taguchi, H. Daimon, J. Fujii, G. Rossi and G. Panaccione *Phys Rev B*, **100**, 045118 (2019)
10. *Reversible modification of ferromagnetism through electrically controlled morphology*. G. Vinai, F. Motti, V. Bonanni, A.Y. Petrov, S. Benedetti, C. Rinaldi, M. Stella, D. Cassese, S. Prato, M. Cantoni, G. Rossi, G. Panaccione, and P. Torelli, *Adv. Electron. Mater.* **5**, 1900150 (2019).
  11. *Room temperature biaxial magnetic anisotropy in  $\text{La}_{0.67}\text{Sr}_{0.33}\text{MnO}_3$  thin films on  $\text{SrTiO}_3$  buffered  $\text{MgO}$  (001) substrates for spintronic applications*. S.K.Chaluvadi, F.Ajejas, P.Orgiani, O.Rousseau, G.Vinai, A.Yu.Petrov, P.Torelli, A.Pautrat, J.Camarero, P.Perna, and L.Mechin *APL* **113**, 052403 (2018).
  12. *Strain-induced magnetization control in an oxide multiferroic heterostructure*. F.Motti, G.Vinai, A.Yu.Petrov, B.A.Davidson, B.Gobaut, A.Filippetti, G.Rossi, G.Panaccione and P.Torelli. *Phys Rev.B* **97**(9), 094423 (2018).
  13. *Quantifying the critical thickness of electron hybridization in spintronics materials*. T.Pincelli, V.Lollobrigida, F.Borgatti, A.Regoutz, B.Gobaut, C.Schlueter, T.-L.Lee, D.J.Payne, M.Oura, K.Tamasaku, A.Yu.Petrov, P.Graziosi, F.Miletto Granozio, M.Cavallini, G.Vinai, R.Ciprian, C.H.Back, G.Rossi, M.Taguchi, H.Daimon, G.van der Laan & G.Panaccione *NatComms* **8**, 16051 (2017)
  14. *Unraveling the magnetic properties of  $\text{BiFe}_{0.5}\text{Cr}_{0.5}\text{O}_3$  thin films*. G.Vinai, A.Khare, D.S.Rana, E.Di Gennaro, B.Gobaut, R.Moroni, A.Yu.Petrov, U.Scotti di Uccio, G.Rossi, F.Miletto Granozio, G.Panaccione, and P.Torelli *APL Materials* **3**, 116107 (2015)
  15. *Surface octahedral distortions and atomic design of perovskite interfaces*. A.Yu.Petrov, X.Torrelles, A.Verna, H.Xu, A.Cossaro, M.Pedio, J.Garcia-Barriocanal, G.Castro and B.A.Davidson *Adv. Materials* **25**, 4043 (2013)
  16. *Evidence of electronic band redistribution in  $\text{La}_{0.65}\text{Sr}_{0.35}\text{MnO}_{3-\delta}$  by hard x-ray photoelectron spectroscopy* C.Schlueter, P.Orgiani, T.-L.Lee, A.Yu.Petrov, A.Galdi, B. A.Davidson, J.Zegenhagen, and C.Aruta *Phys.Rev.B* **86**, 155102 (2012)
  17. *Off-stoichiometry effect on orbital order in A-site manganites probed by x-ray absorption spectroscopy* C.Aruta, M.Menola, A.Galdi, R.Ciancio, A.Yu.Petrov, N.B.Brooks, G.Ghiringhelli, L.Maritato, P.Orgiani *Phys.Rev. B* **86**, 115132 (2012)
  18. *Evidence of direct correlation between out-of-plane lattice parameter and metal-insulator transition temperature in oxygen-depleted manganite thin films* P. Orgiani, A. Yu. Petrov, R. Ciancio, A. Galdi, L. Maritato, and B. A. Davidson. *Appl.Phys.Lett.* **100**, 042404 (2012)
  19. *Local Tunneling Magnetoresistance probed by Low-Temperature Scanning Laser Microscopy*. R. Werner, M. Weiler, A. Yu. Petrov, B. A. Davidson, R. Gross, R. Kleiner, S. T. B. Goennenwein and D. Koelle, *Appl. Phys. Lett.* **99**, 182513 (2011).
  20. *Improved tunneling magnetoresistance at low temperature in manganite junctions grown by molecular beam epitaxy* R.Werner, A.Yu.Petrov, R.Kleiner, D.Koelle, and B.A.Davidson. *Appl. Phys. Lett.* **98**, 162505 (2011)
  21. *Measuring magnetic profiles at manganite surfaces with monolayer resolution* A.Verna, B.A.Davidson, Y.Szeto, A.Yu.Petrov, A.Mirone, A.Giglia, N.Mahne, S.Nannarone. *Journal of Magnetism and Magnetic Materials*, **322**, 1212-1216 (2010).
  22. *Epitaxial growth of  $\text{La}_{0.7}\text{Ba}_{0.3}\text{MnO}_3$  thin films on  $\text{MgO}$  substrates: Structural, magnetic, and transport properties*. P.Orgiani, C.Adamo, C.Barone, A.Galdi, S.Pagano, A.Yu.Petrov, O.Quaranta, C.Aruta, R.Ciancio, M.Polichetti, D.Zola and L.Maritato. *J.Appl.Phys.* **103**, 093902 (2008).

23. *Influence of a single disorder parameter on the conduction mechanisms in manganites thin films.* P.Orgiani, C.Adamo, C.Barone, A.Galdi, A.Yu.Petrov, D.G.Schlom, and L.Maritato. Phys.Rev.B 76, 012404 (2007).
24. *Effect of the substrate ferroelastic transition on epitaxial  $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$  films grown on  $\text{LaAlO}_3$ .* A. Geddo Lehmann, C. Sanna, N. Lampis, F. Congiu, G. Concas, L. Maritato, C. Aruta, A.Yu. Petrov. Eur. Phys. J. B 55 (4), 337 (2007).
25. *Unusual dependence of resistance and voltage noise on current in  $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$  ultrathin films.* C.Barone, C.Adamo, A.Galdi, P.Orgiani, A.Yu.Petrov, O.Quaranta, L.Maritato and S.Pagano. Phys.Rev.B 75, 174431 (2007).
26. *Magneto-transport properties of epitaxial strain-less  $\text{La}_{0.7}\text{Ba}_{0.3}\text{MnO}_3$  thin films.* P.Orgiani, A.Guarino, C.Aruta, C.Adamo, A.Galdi, A.Yu.Petrov, R.Savo, L.Maritato Journal of Applied Physics 101, 33904 (2007).
27. *Intrinsic electric transport in CMR thin films.* S.Mercone, C.A.Perroni, V.Cataudella, G.De Filippis, C.Adamo, M.Angeloni, C.Aruta, F.Miletto-Granozio, A.Oropallo, P.Perna, A.Yu.Petrov, U.S.Di Uccio, G.Balestrino, L.Maritato. Journal of Superconductivity 18(5-6), 719 (2006).
28. *In-plane anisotropy of transport properties in  $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$  ultra-thin films.* P.Orgiani, A.Yu. Petrov, C.Adamo, C.Aruta, C.Barone, G.M.De Luca, A. Galdi, M.Polichetti, D.Zola and L.Maritato. Phys. Rev. B 74, 134419 (2006).
29. *Low-Temperature Resistivity of  $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$  Ultra-thin Films: role of the Quantum Interference Effect.* L.Maritato, C.Adamo, C.Barone, G.M.De Luca, A.Galdi, P.Orgiani and A.Yu.Petrov. Phys. Rev. B 73, 094456 (2006)
30. *Transport properties in manganite thin films.* S.Mercone, C.A.Perroni, V.Cataudella, C.Adamo, M.Angeloni, C.Aruta, G.De Filippis, F.Miletto, A.Oropallo, P.Perna, A.Yu.Petrov, U.Scotti di Uccio and L.Maritato. Phys. Rev. B 71, 064415 (2005)
31. *Room Temperature Metal–Insulator Transition in As Grown  $(\text{La}_{1-x}\text{Sr}_x)_y\text{MnO}_{3+d}$  Thin Films Deposited by Molecular Beam Epitaxy.* A.Yu. Petrov, C. Aruta, S. Mercone, C. Adamo, I. Alessandri, L. Maritato. Eur. Phys. J. B 40 (1), 11, (2004)
32. *High metal-insulator transition temperature in  $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$  thin films grown in low oxygen partial pressure by molecular beam epitaxy.* L.Maritato, A.Yu.Petrov JMMM 272-276, 1135 (2004).
33. *Temperature dependence of high frequency properties of Nb films.* S.L.Prischepa, V.N.Kushnir, A.Yu.Petrov. News of Belarus Engineering Academy, 1(11), 127-128, (2001).
34. *Crossover from thermally activated to regular flow of flux quantum vortices in HTS.* V.N.Kushnir, A.Yu.Petrov, S.L.Prischepa. Physics of the Solid State, 42(9), 1553-1558, (2000).
35. *Volt-ampere characteristics in HTSC near  $T_c$ .* A.Yu.Petrov. News of Belarus Engineering Academy, 1(9), 14-16, (2000).
36. *Upper critical fields in superconductor--normal metal type superlattices in the Ginzburg--Landau approximation.* V.N.Kushnir, A.Yu.Petrov, S.L.Prischepa. Low Temperature Physics, 25(12), 948, (1999).
37. *Vortex lattice dynamics in HTSC.* V.N.Kushnir, A.Yu.Petrov. News of Belarus Engineering Academy, 1(7), 180-182, (1999).
38. *Crossover from thermally activated to steady flow in the vortex dynamics of  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+x}$  thin films.* S.L.Prischepa, A.Vecchione, V.N.Kushnir, M.Salvato, A.Yu.Petrov, C.Attanasio, L.Maritato.– Superconductor Science and Technology, 12(8), 533-537, (1999).
39. *Parallel and perpendicular upper critical fields in multilayer superconductor – normal metal structure.* S.L.Prischepa, V.N.Kushnir, A.Yu.Petrov. Radiotechnics and electronics, 23, 159-163, (1999).

40. *Pinning in superconducting-normal metal superlattices.* S.L.Prischepa, V.N.Kushnir, A.Yu.Petrov, C.Attanasio, L.Maritato Proceedings of SPIE-Int. Society for OpticalEngineering 3480, 140-148 (1998).
41. *Method of calculation of the internal parameters of superconductors.* V.N. Kushnir, A.Yu.Petrov, S.L.Prischepa. - Materials, Technology, Instruments. 3(2), 125, (1998).
42. *Current capability of superconducting communication lines.* S.L.Prischepa, V.N.Kushnir, A.Yu.Petrov. - News of Belarus Engineering Academy, 3(3), 236 - 241, (1997).