

**LIST OF PUBLICATIONS****Refereed papers**

1. **Y. Ryabov**, M. Gribskov, “Spontaneous symmetry breaking in genome evolution” *Nucleic Acids Research*, 36(8) (2008) pp. 2756-2763.
2. **Y. Ryabov**, D. Fushman “Structural Assembly of Multidomain Proteins and Protein Complexes Guided by the Overall Rotational Diffusion Tensor” *Journal of the American Chemical Society*, 129(25) (2007) pp. 7894-7902.
3. **Y. Ryabov**, C. White, Yi Xue, and N. R. Skrynnikov “Introducing color into stacking gels makes sample loading easy”, *Analytical Biochemistry*, 366(1) (2007) pp 111-112.
4. Yi Xue, M. S. Pavlova, **Y. Ryabov**, B Reif, N. R. Skrynnikov “Methyl rotation barriers in proteins from  $^2\text{H}$  relaxation data. Implications for protein structure.” *Journal of the American Chemical Society*, 129(21) (2007) pp. 6827-6838.
5. **Y. Ryabov**, D. Fushman “A Model of Interdomain Mobility in a Multi-Domain Protein” *Journal of the American Chemical Society*, 129(11) (2007) pp. 3315-3327.
6. **Y. Ryabov**, C. Geraghty, A. Varshney, and D. Fushman, “An efficient computational method for predicting rotational diffusion tensors of globular proteins using an ellipsoid representation”, *Journal of the American Chemical Society*, 128(48), (2006) pp. 15432-15444.
7. B. Reif, Y. Xue, V. Agarwal, M. S. Pavlova, M. Hologne, A. Diehl, **Y. Ryabov**, and N. R. Skrynnikov, “Protein Side-Chain Dynamics Observed by Solution- and Solid-State NMR: Comparative Analysis of Methyl  $^2\text{H}$  Relaxation Data”, *Journal of the American Chemical Society*, v. 128(38), (2006) pp. 12354-12355.
8. **Y. Ryabov**, D. Fushman, “Analysis of Interdomain Dynamics in a Two-Domain Protein Using Residual Dipolar Couplings Together with  $^{15}\text{N}$  Relaxation Data”, *Magnetic Resonance in Chemistry*, v.44, (2006) pp. S143-S151.
9. **Y. Ryabov**, D. Fushman, “Interdomain Mobility in Di-Ubiquitin Revealed by NMR”, *PROTEINS: Structure, Function, and Bioinformatics*, v. 63 (2006) pp. 787-796.
10. M.S. Talary, F. Dewarrat, A. Caduff A.Puzenko, **Y. Ryabov**, and Y. Feldman “An RCL sensor for measuring dielectrically lossy materials in the MHz frequency range: 1. Comparison of Hydrogel Model Simulation with actual hydrogel impedance measurements”, *IEEE Transactions on Dielectrics and Electrical Insulation*, v. 13(2), (2006) pp. 247-256.
11. P. Ben Ishai, C. E. M. de Oliveira, **Y. Ryabov**, Yu. Feldman, and A. J. Agranat, “Unusual glass-like systems - relaxation dynamics of  $\text{Cu}^+$  ions in ferroelectric KTN crystals”, *J. Non-Cryst. Sol.* 351 (2005) pp. 2786-2792.

12. Y. Hayashi, A. Puzenko, I. Balin, **Y. Ryabov**, Yu. Feldman, "Relaxation Dynamics in Glycerol-Water Mixtures: II. Mesoscopic feature in water rich mixtures", *J. Phys. Chem. B*, v.109, (2005) pp. 9174-9177.
13. A. Puzenko, Y. Hayashi, **Y. Ryabov**, I. Balin, Yu. Feldman, U. Kaatzte, and R. Behrends "Relaxation Dynamics in Glycerol-Water Mixtures: I. Glycerol-Rich Mixtures" *J. Phys. Chem. B*, v.109, (2005) pp. 6031-6035.
14. A. Khain, V. Arkhipov, M. Pinsky, Y. Feldman and **Y. Ryabov** "Rain enhancement and fog elimination by seeding with charged droplets. Pt.1: Theory and numerical simulations" *Journal of Applied Meteorology*, v 43, (2004) pp. 1513-1529.
15. P. Ben Ishai, C. E. M. de Oliveira, **Y. Ryabov**, Yu. Feldman, and A. J. Agranat, "Glass-forming liquid kinetics manifested in a KTN: Cu crystal", *Physical Review B*, v 70, 132104 (4 pages) (2004).
16. **Y. Ryabov**, G. Marom and Yu. Feldman, "The significance of dielectric spectroscopy in the study of transition dynamics and morphology of transcrystallinity in polymeric composites" *Journal of Thermoplastic Composite Materials*, v. 17 (2004) pp. 463 - 475.
17. **Y. Ryabov**, A. Puzenko, Yu. Feldman, "Nonmonotonous Relaxation Kinetics of Confined Systems" *Physical Review B*, v 69, # 014204, 10 p., (2004).
18. **Y. Ryabov** "Free Volume Concept in Application to Folding Kinetics of Random Heteropolymers" *Journal of Physical Chemistry B*, v 107, (2003) pp. 12009-12012.
19. **Y. Ryabov** "Behavior of Fractional Diffusion at Origin" *Physical Review E, Rapid Communications*, v. 68, (2003) 03012(R).
20. **Y. Ryabov**, Yu. Feldman Reply to 'Comment on" Novel approach to the analysis of the Non-Debye dielectric spectrum broadening " ' *Physica A*, v. 326 (2003) pp. 607-608.
21. **Y. Ryabov**, Y. Hayashi, A. Gutina, Y. Feldman "Features of Supercooled Glycerol Dynamics" *Physical Review B* v. 67, 132202 (4 pages) (2003).
22. **Y. Ryabov**, Yu. Feldman "The relationship between the scaling parameters and relaxation time for non-exponential relaxation in disordered systems" *Fractals* v. 11 suppl. February (2003) pp.173-183.
23. **Y. Ryabov**, H. Huriel, G. Marom, Yu. Feldman "Relaxation peak broadening and polymer chain dynamics in aramid fiber reinforced nylon 66 microcomposites" *Journal of polymer science Part B: Polymer Physics*, Vol. 41, (2003) pp. 217-223.
24. **Y. Ryabov**, A. Puzenko "Damped Oscillations in View of Fractional Oscillator Equation", *Physical Review B* v. 66, 184201 (8 pages) (2002)
25. **Y. Ryabov**, Yu. Feldman " Novel approach to the analysis of the Non-Debye dielectric spectrum broadening " *Physica A*, v. 314 (2002) pp. 370-378.

26. Yu. Feldman, A. Puzenko, **Y. Ryabov** "Non Debye Dielectric Relaxation in Complex Materials" *Chemical Physics* v. 284, Issue 1-2 (2002) pp. 139-168.
27. **Y. Ryabov**, Yu. Feldman, N. Shinyashiki, S. Yagihara " The symmetric broadening of the water relaxation peak in polymer-water mixtures and its relationship to the hydrophilic and hydrophobic properties of polymers " *J. Chem Phys.* V. 116, N19 (2002) pp. 8610-8615.
28. Y. Haruvy, **Y. Ryabov**, V. Arkhipov, A. Gutina, E. Axelrod, Yu. Feldman "Fast-sol-gel derived silsequioxane glasses embodying glycerol moieties: dielectric properties and morphology" *J. Non-Cryst. Sol.* 305 (2002) pp. 226-234.
29. Yu.A. Gusev, N.N.Soutougin, **Y. Ryabov** and F.I.Derkatch, "Dielectric and NNR Relaxation of Water in Sandstone", *International Journal of science "Georesources"* 1 (4) 2001, pp. 17-20.
30. **Y. Ryabov**, A. Gutina, V. Arkhipov, and Yu. Feldman, "Dielectric relaxation of water absorbed in porous Glass", *J. Phys. Chem. B*, 105(9) (2001) pp. 1845-1850.
31. I. Ermolina, G.Smith, **Y. Ryabov**, Yu. Polevaja, A. Puzenko, R. Nigmatullin, and Yu.Feldman, "Effect of Penetration on the Dynamic Behavior of Phoshatidylcholine Headgroups in Liposomes", *J. Phys. Chem. B*, V 104, N 6 (2000) pp. 1373-1381.
32. R.R. Nigmatullin, M.N. Ovchinnikov, **Y. Ryabov**, "Fractals: from the tracery to the motion" *Priroda*, № 2 (1998) pp. 61-71 (*in Russian*).
33. R.R. Nigmatullin, **Y. Ryabov**, "Cole-Cole Relaxation and the self-similar relaxation process", *Uzvestia VUZ: Physica*, № 4 (1997) pp. 6-11.
34. R.R. Nigmatullin, **Y. Ryabov**, "Cole-Davidson Relaxation and the self-similar relaxation process ", *Fiz. Tverd. Tela (st. Petersburg)*, Vol. 39, № 1 (1997) pp. 101-105 (*in Russian*); R.R. Nigmatullin, **Y. Ryabov**, "Cole-Davidson Relaxation and the self-similar relaxation process ", *Physics of the Solid State*, Vol. 39, № 1 (1997) pp. 87-90 (*English translation*).
35. Yu. Feldman, N. Kozlovich and Y. Alexandrov, R. Nigmatullin and **Y. Ryabov** "Mechanism of the cooperative relaxation in microemulsion near the percolation threshold" *Phys. Rev. E*. v. 54, N.5 (1996) pp.5420-5427.

### Patents and patent applications

36. A. Caduff, P. Truffer, **Y. Ryabov**, Y. Feldman, A. Puzenko "A method and device for determining a parameter of living tissue" WO 2005/120332.
37. Y. Feldman, A. Khain, M. Pinsky, V. Arkhipov, **Y. Ryabov**, A. Puzenko "Apparatus for controlling atmospheric conditions", WO 2005/053379.
38. A. Khain, Y. Feldman, M. Pinsky, V. Arkhipov, **Y. Ryabov**, A. Puzenko "Method and apparatus for controlling atmospheric conditions", US 2004/0134997.

39. A. Khain, Y. Feldman, M. Pinsky, V. Arkhipov, **Y. Ryabov**, A. Puzenko “Method and apparatus for controlling atmospheric conditions”, WO 2003/061370.

### Invited lectures

40. **Y. Ryabov**, “Concepts of Computational Biology”, Johns Hopkins University, Montgomery County Campus, June, 24, 2008.
41. **Y. Ryabov**, “Structural and Computational Biology: relationship between structure and dynamics of proteins”, Kazan Institute of Biochemistry and Biophysics, Kazan Science Centre of Russian Academy of Sciences, Kazan, Russia, May, 29, 2008.
42. **Y. Ryabov**, “Structural and Computational Biology: relationship between structure and dynamics of proteins”, Kazan State University, Department of Theoretical Physics, Kazan, Russia, May, 23, 2008.
43. **Y. Ryabov**, “Multi-domain protein Structure and Dynamics with insights for bioinformatics”, Indiana University, Bloomington, March, 16, 2007.
44. **Y. Ryabov**, “Dynamics of Di-Ubiquitin ” Purdue University, March, 2006.

### Contributed volumes

45. Y. Feldman, A. Puzenko and **Y. Ryabov**, “*Chapter 1. Dielectric Relaxation Phenomena in Complex Materials*”, pp. 1-125, *Advances in Chemical Physics*, Volume 133, Part A, *Fractals, Diffusion and Relaxation in Disordered Complex Systems*, Yuri P. Kalmykov (Editor), William T. Coffey (Editor), Stuart A. Rice, ISBN: 0-471-72507-2, Hardcover, 592 pages, July 2006.
46. Y. Hayashi, **Y. Ryabov**, A. Gutina and Yu. Feldman, “Slow Dynamics and Dielectric Relaxation in Water/Glycerol Mixtures” in *Slow Dynamics in Complex Systems* by M. Tokuyama and I. Oppenheim (Eds.), American Institute of Physics, Melville, New York, (2004) Vol. 708, pp.671-672.
47. **Y. Ryabov**, Yu. Feldman “The relationship between the scaling parameter and relaxation time for non-exponential relaxation in disordered systems” in *Scaling and Disordered Systems* by F. Family, M. Daoud, H. J. Herrmann, H. E. Stanley (Eds.), World Scientific, Singapore, 2002, pp. 173-183.
48. Yu. Feldman, **Y. Ryabov**, A. Puzenko, A. Gutina and N. Kozlovich, “Dielectric relaxation of water adsorbed in pore surface of silica glasses” in AIP conference proceedings *Slow Dynamics in Complex systems*, Fukuoka, Japan, November 1998, pp. 236-242.

### Oral talks

49. **Y. Ryabov**, D. Fushman, "Inter-Domain Dynamics in a Two-Domain Protein Studied by NMR", 2006 March 13-17, APS meeting, Baltimore, USA.
50. **Y. Ryabov**, Y. Hayashi, A. Gutina, Yu. Feldman, Oral Contribution "New Features of Supercooled Glycerol Dynamics", 2<sup>nd</sup> international Conference on Broadband Dielectric Spectroscopy and its Applications, 2-6 September, 2002, Leipzig, Germany.
51. Yu. Feldman, **Y. Ryabov**, A. Gutina, and V. Arkhipov, Oral Contribution "Dielectric Relaxation of Water Absorbed in Porous Glasses", Fourth International Conference on Electromagnetic Wave Interaction with Water and Moist Substances, Weimar, Germany, 13 – 16 May 2001, Proceedings pp. 39-45.
52. V. I. Arkhipov, **Y. Ryabov**, A. Khain and M. Pinsky, Oral presentation "Growth of Water Droplet with Soluble Kernel", 15th Annual Meeting of Israel Association for Aerosol Research, 10 May 2001, The Hebrew University of Jerusalem.
53. **Y. Ryabov**, Yu. Feldman, Oral presentation "The relationship between the Cole-Cole exponent and the mean relaxation time", 1<sup>st</sup> International Conference DIELECTRIC SPECTROSCOPY IN PHYSICAL, CHEMICAL AND BIOLOGICAL APPLICATIONS **DS 2001**, Jerusalem, 12-15 March 2001, Israel.
54. **Y. Ryabov**, Yu Feldman, Oral presentation "The Relationship between the Scaling Parameter and Relaxation Time Non-exponential Processes in Disordered Systems" on the International Workshop on Scaling and Disordered Systems April 13-14, 2000, Paris.
55. **Y. Ryabov**, Yu Feldman, Oral presentation "The Cole-Cole Exponent and It's Relation to The Relaxation Time", 6th International Conference DIELECTRIC AND RELATED PHENOMENA DRP2000, Spala, Poland 6-10 September 2000, book of abstract p. 61.

### Conference proceedings

56. Sh. Kayumov, M.N.Ovchinnikov, **Y. Ryabov**. "Percolation Models Using for Relative Phase Permeability Calculation". Proc. Int.Conf. Geometrization of Physics IV. Kazan, October 4-8, 1999, pp.155-156.
57. I. Ermolina, G. Smith, **Y. Ryabov**, A. Puzenko and Yu. Feldman, "Dielectric relaxation in lecithin liposome bilayer at presence of enhance penetration additives", the paper was presented at Dielectric Society Annual Meeting, April 3-2, 1999, Canterbury, England.
58. I. Ermolina, G. Smith, Y. Polevaya, **Y. Ryabov**, R. Nigmatullin and Yu. Feldman, "The influence of additives on the dynamic behavior of the head groups of lecithin liposomes", the paper was presented at 15<sup>th</sup> European Chemistry at Interface Conference (ECIC), October 18-22, 1998, Jerusalem, Israel.

59. Yu. Feldman, **Y. Ryabov**, E. Rysyakiewicz-Paseck "The cooperative relaxation in porous glasses", the paper was presented Eighth Tohwa University International Symposium, November 7-11, 1998, Fukuoka, Japan.
60. Yu. Feldman, **Y. Ryabov**, E. Rysiakiewicz-Paseck, A.Gutina, N.Kozlovich, "Cooperative relaxation of water at the pore surface of silica glasses", in proceedings of the 4<sup>th</sup> International Seminar PGL'98, Szklarska Poreba, Poland 1998.
61. **Y. Ryabov**, "The generalised transport equation", Proceedings of the First Regional Young Scientist School "Coherent Optics and Optical Spectroscopy" Kazan (1998) October 29-31. pp. 67 - 72.
62. Yu. Feldman, R. Nigmatullin, A. Gutina, A. Puzenko, and **Y. Ryabov**, The cooperative relaxation in pores glasses, the paper was presented at Dielectric Society Annual Meeting, Canterbury, England, April (1998), pp. 2-4.
63. **Y. Ryabov**, S.S. Kharitsev, R.R. Nigmatullin, M.Kh. Salakhov, M. Planat, "The fractal noise smoothing procedure", Proceedings of the First Regional Young Scientist School, Kazan, (1997) November 20 - 22. pp. 85-90.
64. R. Nigmatullin, **Y. Ryabov**, E. Poligalov, Yu. Feldman, The fractal Nature of Electrode polarization, Paper in Proceedings of the 7-th International Conference on Dielectric Materials Measurements & Applications, University of Bath, UK: 23-26 September (1996) pp.164-167.
65. N. Kozlovich, Yu. Alexandrov, Yu. Feldman, **Y. Ryabov**, and R. Nigmatullin, Non-Exponential Dynamics In The Microemulsions Near The Percolation Threshold From Time Domain Dielectric Spectroscopy, Paper in Proceedings of the 7-th International Conference on Dielectric Materials Measurements & Applications, University of Bath, UK: 23-26 September (1996) pp.160-163.
66. A. Le Mahaute, R.R. Nigmatullin, **Y. Ryabov**, Notes to the correct interpretation between procedure of averaging a smooth function over Cantor set and temporal fractional integral, Proc. Int. Conf "Geometrization of Physics", Kazan State University, (1995) pp.119-124.

#### **Poster contributions**

67. **Y. Ryabov**, C. D. Schwieters, Poster Contribution "Structure determination of protein-protein complexes using parameters of their overall rotational dynamics available via NMR relaxation data", 3Dsig 2008, a satellite meeting of ISMB 2008, July 18-19, 2008, Toronto, Canada.
68. **Y. Ryabov**, M. Gribskov, Poster Contribution "Spontaneous Symmetry Breaking in Genome Evolution", ISMB 2008, July 20-23, 2008, Toronto, Canada.

69. **Y. Ryabov**, Y. Xue, N. Skrynnikov, Poster Contribution "Re-introducing Anisotropic Diffusion into MD Trajectories of Proteins" Experimental Nuclear Magnetic Resonance Conference (ENC), April 22-27, 2007, Daytona Beach, Florida, USA.
70. Y. Xue, M. Pavlova, **Y. Ryabov**, A. Zhuravleva, N. Skrynnikov, V. Agarwal, M. Hologne, A. Diehl, B. Reif, Poster Contribution "More insights from methyl relaxation data" Experimental Nuclear Magnetic Resonance Conference (ENC), April 22-27, 2007, Daytona Beach, Florida, USA.
71. **Y. Ryabov**, D. Fushman, Poster contribution "Inter-Domain Dynamics in a Two-Domain Protein Revealed by NMR", 46<sup>th</sup> international Experimental Nuclear Magnetic Resonance Conference (ENC), April 10-15, 2005, Providence, Rhode Island, USA, book of abstracts P 22, 77.
72. **Y. Ryabov**, A. Puzenko, Poster contribution "Some analytical results for fractional oscillator", 2<sup>nd</sup> international Conference on Broadband Dielectric Spectroscopy and its Applications, 2-6 September, 2002, Leipzig, Germany, book of abstracts P 47.
73. **Y. Ryabov**, V. I. Arkhipov, A. Khain, M. Pinsky, Poster contribution "Growth of Water Droplet with Soluble Kernel", Gordon Research Conference "Water and Aqueous Solutions", Holderness School, Plymouth, New Hampshire, USA, 4-9 August 2002.
74. **Y. Ryabov**, Yu. Feldman, N. Shinyashiki, S. Yagihara, Poster contribution "Symmetric Broadening of water relaxation peak in polymer-water mixtures", Gordon Research Conference "Water and Aqueous Solutions", Holderness School, Plymouth, New Hampshire, USA, 4-9 August 2002.
75. **Y. Ryabov**, Yu. Feldman, Poster contribution "The Havriliak-Negami parameters and their relationship to the dynamic and structural properties of complex systems", Horizons in Complex Systems, Messina, Italy, 5-8 December 2001.
76. E. Axelrod, Ya. Haruvy, A. Gutina, **Y. Ryabov** and Yu. Feldman, Poster contribution "Fast-sol-gel glasses embodying glycerine moieties: dielectric properties and morphology", S-11, Heraklion, Crete, Greece, 17-23 June 2001.
77. **Y. Ryabov**, Yu. Feldman, Poster contribution "The Havriliak-Negami parameters and their relationship to the dynamic and structural properties of complex systems", F-20, Heraklion, Crete, Greece, 17-23 June 2001.
78. **Y. Ryabov**, Yu. Feldman, abstract of the poster presentation "Scaling properties and irreversibility in the statistical systems", International Workshop on FRONTIERS IN THE PHYSICS OF COMPLEX SYSTEMS, 25-28 March 2001, book of abstracts p. 83.
79. Yu. Gusev, N. Soutugin, **Y. Ryabov** Poster presentation "Dielectric and NMR Relaxation of Water in Sandstone", 6th International Conference DIELECTRIC AND RELATED PHENOMENA DRP 2000, Spala, Poland 6-10 September 2000, book of abstract p. 77.

80. **Y. Ryabov**, A. Gutina, V.I. Arkhipov, and Yu Feldman, Poster presentation "Cooperative Relaxation of Water Confined at Porous Glasses", 6th International Conference DIELECTRIC AND RELATED PHENOMENA DRP 2000, Spala, Poland 6-10 September 2000, book of abstract p. 76.
81. Yu. Feldman, N. Kozlovich, A. Puzenko, Yu. Alexandrov, **Y. Ryabov** and R. Nigmatullin, Investigation of the mesoscale structure and non-exponential dielectric response of ionic microemulsions, the paper will be presented at the 12 th International Symposium on Surfactants in Solutions, June 7-11, 1998, Stockholm, Sweden.
82. I. Ermolina, **Y. Ryabov**, Yu. Polevaja, G. Smith, H. Derbyshire and Yu. Feldman, Study of the influence of additives on mobility of the zwitterionic head group of egg lecithin liposomes, paper was presented at Electrokinetic Phenomena 98, International Symposium, April 14-17, 1998, Salzburg, Austria.
83. B.N. Kazakov, A.V. Mikheev, R.R. Nigmatullin, **Y. Ryabov**, X International Conference on Luminescence and Optical Spectroscopy of Condensed Matter ICL '96, August 18-23, Prague (1996).
84. A.V. Mikheev, **Y. Ryabov**, " The Static Luminescence Extinguishing in the Framework of the Coordination Sphere Model", Thesis of the II Young Scientist Conference, Kazan, 28 June - 1 July (1996), p.80.
85. R.R. Nigmaullin, **Y. Ryabov**, "Application of Non-integer Order Differentiation Operator to the Non-exponential Relaxation", Thesis of the II Young Scientist Conference, Kazan, 28 June - 1 July (1996), p. 41.
86. Yu. Alexandrov, N. Kozlovich, A. Gutina, Yu. Feldman, R. Nigmatullin and **Y. Ryabov**, 11-th International Symposium on Surfactants in Solutions, Book of Abstracts, June 9-13, Jerusalem, Israel (1996) p. 286.
87. Yu. Feldman, N. Kozlovich, Yu. Alexandrov, R. Nigmatullin and **Y. Ryabov**, the International Conference on Electrokinetic Phenomena 96, Rome, Italy, 30 September- 4 October (1996).
88. N. Kozlovich, Yu. Alexandrov, Yu. Feldman, R. Nigmatullin and **Y. Ryabov**, 3rd Liquid Matter Conference, Uurophys. Conf. Abstr., v. 20B, P7-13, University of East Anglia, Norwich, UK, 6-10 July, (1996).
89. B.N. Kazakov, A.V. Mikheev, **Y. Ryabov**, Thesis of X Pheophilov's Symposium, Sant-Petersburg, (1995) pp. 185-186.
90. R.R. Nigmatullin, V.A. Goncharov, **Y. Ryabov** "Exact solution of "Superslow relaxation" equation and its experimental proof" Extended abstracts of the XXVII congress AMPERE, Kazan (1994) 21-28 August pp. 251-252.