Liubov Markovich

Resumé

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Birth Place and Date:

Moscow, Russia, 25.09.1992

Citizenship:

Russian Federation

Family Status:

Unmarried

Education

Bachelor, *Moscow Institute of Physics and Technology (MIPT)*, Moscow, Russia, *Bachelor diploma in MIPT, 2013.*. **2009–2013**
Title "Nonparametric estimation of the density and its derivative at compact sets".

Master, *Moscow Institute of Physics and Technology (MIPT)*, Moscow, Russia, *Master diploma in MIPT, 2015.*. **2014–2015**
Title "Kernel estimation of the density and its derivatives and application"

PhD, *Moscow Institute of Physics and Technology (MIPT)*, Moscow, Russia, *Defence in MIPT 1st March 2018.*. **2015–2018**
Title "Probability, information and correlation characteristics of quantum systems"

Supervisors

In the V.A. Trapeznikov Institute of Control Sciences of Russian Academy of Sciences:

Dr Hab A.V. Dobrovidov (dobrovid@ipu.ru) from 2013-2015
In the P.N. Lebedev Physical Institute, Russian Academy of Sciences:

Prof Dr Hab V.I. Man'ko (manko@lebedev.ru) from 2014-present

Employment and Research Experience

Mathematician, *V.A. Trapeznikov Institute of Control Sciences*, Moscow, Laboratory 38, Profsoyuznaya 65, 117997 Moscow, Russia,. Phone: +79168305103	**2012–2015**
Engineer, *Moscow Institute of Physics and Technology*, Moscow, Laboratory of Quantum Information Theory, Institutskii Per. 9, . Dolgoprudny Moscow Region 141700, Russia	**2014–2015**
Junior scientific researcher, *V.A. Trapeznikov Institute of Control Sciences*, Moscow, Laboratory 38, Profsoyuznaya 65, 117997 Moscow, Russia,. Phone: +79168305103	**2015–2017**
Scientific researcher, *V.A. Trapeznikov Institute of Control Sciences*, Moscow, Laboratory 38, Profsoyuznaya 65, 117997 Moscow, Russia,. Phone: +79168305103	**2017–present**
Junior scientific researcher, *Institute for information transmission problems (IITP RAS) (Kharkevich Institute)*, Moscow, Laboratory 7, Bolshoy Karetny per. 19, build.1, Moscow 127051, Russia. Phone: 7 495 650 4225	**2016–present**

Languages

English: Upper-Intermediate

German: Upper-Intermediate

French: Beginner

Russian: Mother tongue

Research Experience and Interests:

1: Theoretical physics, quantum mechanics, applied physics, quantum information theory, mathematical physics, entanglement

2: Statistics, probability theory, nonparametric density estimation, modeling of stochastic processes, Kalman filtration, special functions, group theory

Teaching Experience:

○ NO

Referee Activities:

○ Journal of Statistical Planning and Inference

Membership:

○ Bernoulli society

Academic awards:

- The best scientific work of young scientists in control theory and its applications in 2013, Institute of Control Sciences of Russian Academy of Sciences.
- Wakimoto Memorial Fund, ISI Young Statisticians Meeting Hong Kong, 23-24 August 2013.

- Award for the best bachelor thesis in applied mathematic and physic of MIPT, 2013.
- Trapeznikov's award of the Institute of Control Sciences Russian Academy of Sciences, 2015, 2016, 2017
- A Foundation for Basic Research, grant 14-50-00150, 2016, 2017

- Award for the best scientific work of young scientists on 56th scientific conference of MIPT, 2013

- An Foundation for Basic Research, grant 13-08-00744 A, 2013-2014, A Foundation for Basic Research, grant 16-08-01285 A, 2015-2018

- Pugachev's award of the Institute of Control Sciences Russian Academy of Sciences, 2014.

Visits as invited scientist:

- Student Exchange between Palermo University and Moscow Institute of Physics and Technology State University, Russia. 22 October - 21 November, 2014.
- Student Exchange between Palermo University and Moscow Institute of Physics and Technology State University, Russia. 19 October - 18 November, 2016.

Publications in Quantum Mechanics:

1: V.I. Man'ko and L.A. Markovich Entropic inequalities and properties of some special functions, J. Russ. Laser Res., **35(2)**, 2014, 200–210, (DOI 10.1007/s10946-014-9414-7), (arxiv:1401.3117)

2: V.I. Man'ko and L.A. Markovich New inequalities for quantum von Neumann and tomographic mutual information, J. Russ. Laser Res., **35(4)**, 2014, 355–361, (DOI 10.1007/s10946-014-9436-1), (arXiv:1403.3820)

3: V.I. Man'ko and L.A. Markovich Separability and entanglement of the qudit X-state with $j = 3/2$, J. Russ. Laser Res., **35(5)**, 2014, 518–524, (DOI 10.1007/s10946-014-9455-y), (arXiv:1404.1454)

4: V.I. Man'ko and L.A. Markovich New Minkowski type inequalities and entropic inequalities for quantum states of qudits, Int. J. Quantum Inform., **12 (7n08)**, 2014, 1560021, (DOI 10.1142/s02197-499-1560-0217), (arXiv:1409.0475)

5: V.I. Man'ko and L.A. Markovich Separability and entanglement of spin

1 particle, J. Russ. Laser Res., **36(2)**, 2015, 110–118, (DOI 10.1007/s10946-015-9484-1), (arXiv:1406.7118)

6: V.I. Man'ko and L.A. Markovich Deformed entropic and information inequalities for X - states of two-qubit and single qudit state, Advances in Mathematical Physics, vol. 2015, 717621, 2015, (DOI:10.1155/2015/717621), (arXiv:1410.1330)

7: V.I. Man'ko and L.A. Markovich Inequalities for purity parameters for multipartite and single qudit states, J. Russ. Laser Res., **37(2)**, 2016, 133–140, (DOI:10.1007/s10946-016-9553-0), (arXiv:1502.02371)

8: V.I. Man'ko and L.A. Markovich Steering and correlations for the single qudit state on the example of $j = 3/2$, J. Russ. Laser Res., **36(4)**, 2015, 343–349, (DOI 10.1007/s10946-015-9508-x), (arXiv:1503.02296)

9: V.I. Man'ko and L.A. Markovich Steering in spin tomographic probability representation, Physica A: Statistical Mechanics and its Applications, **458**, 2016, 266–275, (DOI:10.1016/j.physa.2016.04.008),(arXiv:1505.03624)

10: V.I. Man'ko and L.A. Markovich Entropic inequalities for matrix elements of rotation group irreducible representations, Lobachevskii Journal of Mathematics, **38(4)**, 699–708, 2017, (arXiv:1511.07341)

11: V.I. Man'ko and L.A. Markovich Photon distributions and information nonnegativity versus quadrature uncertainty relation, Engineering Physics, **9**, 34-42, 2016, (arXiv:1603.01345)

12: V.I. Man'ko, L.A. Markovich and A. Messina, Breakdown of separability due to confinement, Reports on Mathematical Physics, **80(3)**, 277–294, 2017, (arXiv:1508.04532)

13: L.A. Markovich, R. Grimaudo, A. Messina, H. Nakazato An example of interplay between Physics and Mathematics: Exact resolution of a new class of Riccati Equations, Annals of Physics, **385**, 522–531, 2017

14: V.I. Man'ko and L.A. Markovich Entropy-Energy Inequality for a Qutrit on the Example of a Three-Level Atom, Russian Physics Journal, March, March 2017, Volume 59, Issue 11, pp 1937Ű1941 (arXiv:1608.01821)

15: V.I. Man'ko and L.A. Markovich Optimal nonlinear filtering of quantum state, to be published in IEEE Transactions on Information Theory, 2018 (arXiv:1701.06130)

16: V.I. Man'ko and L.A. Markovich Separability and entanglement in the Hilbert space reference frames related through the generic unitary transform for four level system, 1–19 International Journal of Theoretical Physics, 2018 (DOI: 10.1007/s10773-017-3658-2) (arXiv:1705.07433)

17: V.I. Man'ko and L.A. Markovich Unnormalized tomograms and quasi-distributions of quantum states, working paper Theoretical and mathematical physics, 2018 (arXiv:1708.04847)

18: V.I. Man'ko and L.A. Markovich Symplectic tomography of de Broglie wave, J. Russ. Laser Res., 38(6), 507-515, 2017 (10.1007/s10946-017-9674-0)

19: V.I. Man'ko and L.A. Markovich, working paper, Quantum tomography for the nonlinear interacting oscillators, 2018

Publications in Statistics:

1: Markovich, L.A. Nonparametric gamma kernel estimators of density derivatives on positive semi-axis by dependent data, Revstat Stat J, **14 (3)**, 327–348, 2016
(arXiv:1401.6783)

2: Markovich, L.A. Inferences from optimal filtering equation, Lithuanian Mathematical Journal, **55 (3)**, 2015, 413–432, (DOI 10.1007/s10986-015-9289-5)
(arXiv:1402.1823)

3: Markovich, L.A. Nonparametric estimation of multivariate density and its derivative by dependent data using gamma kernels, (submitted in Fundamental and Applied Mathematics), 2018
(arXiv:1410.2507)

4: Markovich, L.A. Light- and heavy- tailed density estimation by gamma and Gamma-Weibull kernels, submitted in the book of proceedings of the third ISNPS Conference, 2018

Publications in Conferences Proceedings in Quantum Mechanics:

1: V.I. Man'ko and Markovich L.A. New inequalities for quantum von Neumann and tomographic mutual information, "Advances in foundations of quantum mechanics and quantum information with atoms and photons",Turin, Italy, 26–31 may, 2014, poster

2: V.I. Man'ko and Markovich L.A. Separability, entanglement and Minkowski type inequality of the qudit X-state with $j = 3/2$, Quantum theory: from problems to advances - QTPA at Linnaeus University, June 9–12, 2014, poster

3: Markovich L.A., New Minkowsky type matrix inequalities and entropic inequalities for qudits, 57th scientific conference in MIPT, 2014

4: V.I. Man'ko and Markovich L.A. Steering in spin tomographic probability representation, 58th scientific conference in MIPT, (MIPT-poligraf), ISBN: 978-5-7417-0582-7, 22, 2015

5: V.I. Man'ko and Markovich L.A. New Inequalities for Matrix Elements of Rotation Group Irreducible Representations, QBNETWORKS 2016, 30 March - 1 April, Barcelona, Spain, 2016

6: V.I. Man'ko and Markovich L.A. Nonnegativity of Quantum Information and Photon Distributions Versus Quadrature Uncertainty Relation, Quantum Roundabout, Nottingham, 6th-8th July 2016

7: V.I. Man'ko and Markovich L.A. Spin tomographic probability theory in steering phenomena, Information Technology and Systems 2016 (ITaS 2016) The 40th Interdisciplinary Conference and School September, 25-

30, Repino, St. Petersburg, Russia, 2016

8: V.I. Man'ko and Markovich L.A., Entropy-energy inequality for quntrit systems, 59th scientific conference in MIPT, (MIPT-poligraf), ISBN: 978-5-7417-0582-7, 22, 2016

9: Markovich L.A., The Separability property in confined quantum systems, Quantum2017, Turin, Italy, 7-13 May, 2017

10: Markovich L.A., Interplay between Physics and Mathematics: Exact resolution of a new class of Riccati Equations, Information Technologies and Systems 2017 (ITaS 2017), Ufa, Russia, 14-18 September, 2017

11: V.I. Man'ko and Markovich L.A., Optimal nonlinear filtering of quantum states, 60th scientific conference in MIPT, (MIPT-poligraf), ISBN: 978-5-7417-0582-7, 20-25 November, 2017

Publications in Conferences Proceedings in Statistics:

1: Markovich L.A. Detection of critical points for the reliability of physical tasks (poster), World statistics congress ISI 2011, Dublin, August 21–26, 2011

2: Dobrovidov A.V., Markovich L.A. Nonparametric gamma kernel estimators of density derivatives on positive semi-axis, Proceedings of the International IFAC conference on Manufacturing Modelling, Management, and Control, MIM' 2013 , 944–949, Saint-Petersburg, Russia, June 19–21, 2013 (arXiv:1401.6783)

3: Dobrovidov A.V., Markovich L.A. Data-driven bandwidth choice for gamma kernel estimates of density derivatives on the positive semi-axis, Proc. of IFAC International Workshop on Adaptation and Learning in Control and Signal Processing, 500–505, 2013, Caen, France, July 3–5, 10.3182/20130703-3-FR-4038.00086, 2013 (arXiv:1401.6801)

4: Markovich, L.A., Dobrovidov, A.V. Data-Driven Smoothing of Gamma Kernel Estimation of a Density Derivative, 59th ISI World statistic congress, in Proc. YSI August 25–30, p.30., 2013

5: Markovich L.A. Gamma kernel estimation of a density derivative, Report on the fifth traditional school for the young scientists, "Information, control and optimization", Moscow, p.5., 2013

6: Markovich L.A. Nonparametric estimation of density and its derivative on the compact support, 56th scientific conference in MIPT, 25–30 November, 105-106, 2013

7: Markovich L.A. The equation of the optimal filtering and Kalman's filter, Report of the seminar laboratory 7, "Adaptive and Robust systems named Ya.Z. Tsypkin", Institute of Control Sciences of Russian Academy of Sciences, 25 February, 2014

8: Markovich L.A. The equation of the optimal filtering and Kalman's filter. XII Meeting on Control, Russia, Moscow, Institute of Control Sciences of Russian Academy of Sciences, 16–19 June, 1108–1113, ISBN

978-5-91450-151-5, 2014

9: Markovich L.A. Inferences from optimal filtering equation, Kalman's filter and theorem on normal correlation, Report on the sixth traditional school for the young scientists, "Information, control and optimization", Moscow, p. 40, 2014

10: Dobrovidov A.V., Markovich L.A. Regularization Procedure of Positive Signal Estimation in Multiplicative Model, in the Book of abstracts of 2nd Conference for nonparametric statistics (ISNPS) 2014, Universidad Carlos III and ISNPS, Cadiz, Spain, 39–40, ISBN: 978-84-89315-69-3, 2014

11: Markovich L.A. The equation of optimal filtering, Kalman's filter and Theorem on normal correlation, in proc. 11th International Vilnius Conference on Probability and Mathematical Statistics, p. 182, 30 June–4 July, Vilnius, Lithuania, ISBN 978-609-433-220-3, 2014

12: Markovich L.A. Gamma kernel estimation of a density derivative on the positive semi-axes by dependent data, 57th scientific conference in MIPT, 15 (1-6), ISBN: 978-5-7417-0550-6, 2014

13: Markovich L.A. Multivariate Density and Derivative Gamma Kernel Estimation by Dependent Data, ICRA6 and RISK 2015, 26–29 May, Spain, Barcelona, 499–506, ISBN 978-84-9844-496-4, 2015

14: Markovich L.A. Multivariate Density and Derivative Gamma Kernel Estimation by Dependent Data, Bamberg Otto-Friedrich University, 16 July, 2015

15: Markovich L.A. Light- and heavy-tailed density estimation by gamma and gamma-weibull kernels, ISNPS, Avignon, 11-16 June, 2016