

Curriculum Vitae

Last name / Surname: Filipkovska (Filipkovskaya)

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INSTITUTION

B. Verkin Institute for Low Temperature Physics and Engineering of the National Academy of Sciences of Ukraine (B. Verkin ILTPE of NAS of Ukraine),

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ACADEMIC DEGREE

Ph.D. (Physical and Mathematical Sciences)

EDUCATION

Ph.D. (Candidate of Physical and Mathematical Sciences), School of Mechanics and Mathematics (now, School of Mathematics and Computer Sciences), V.N. Karazin Kharkiv National University, Kharkiv, Ukraine, 2012-2015 (diploma issued by Kharkiv National University of Radio Electronics in 2016)

Specialty: Mathematical Simulation and Methods of Calculation

Thesis: Global solvability of differential-algebraic equations and mathematical modelling of the dynamics of nonlinear radio engineering circuits

Scientific adviser: D.Sc., Prof. A.G. Rutkas

Master of Science (Applied Mathematics), School of Mechanics and Mathematics, V.N. Karazin Kharkiv National University, 2007-2012

POSITIONS

- **Senior Research Fellow** (2021– *the present time*), Department of Mathematical Physics, Mathematical Division, B. Verkin ILTPE of NAS of Ukraine
- **Research Fellow** (2017–2021), Department of Mathematical Physics, Mathematical Division, B. Verkin ILTPE of NAS of Ukraine
- **Associate professor** (2018–2019), Department of Electronics and Control Systems, School of Computer Sciences, V.N. Karazin Kharkiv National University
- **Senior Lecturer** (2017–2018; 2019–2020), Department of Electronics and Control Systems, School of Computer Sciences; Department of Higher Mathematics and Computer Sciences, School of Mathematics and Computer Sciences, V.N. Karazin Kharkiv National University
- **Junior Research Fellow** (2016–2017), Department of Mathematical Physics, Mathematical Division, B. Verkin ILTPE of NAS of Ukraine

- *Junior Research Fellow* (2013–2014), *Senior laboratory assistant* (2012), *Laboratory assistant* (2012), Department of Mathematical Modeling and Software, School of Mechanics and Mathematics (now, School of Mathematics and Computer Sciences), V.N. Karazin Kharkiv National University (research work “Analysis of evolution problems with equations of the Sobolev type”, state registration No. 0111U010369, 2012–2014)

RESEARCH INTERESTS

Differential-algebraic equations, operator-differential equations, descriptor systems, degenerate differential equations: theory (solvability, stability, global dynamics), numerical methods, and applications.

Nonlinear integrable PDEs: inverse scattering transform method, associated matrix Riemann-Hilbert problems, and long-time asymptotics.

GRANTS, RESEARCH AWARDS AND SCHOLARSHIPS

- Grant of the National Academy of Sciences of Ukraine (project “Qualitative, asymptotic and numerical analysis of various classes of differential equations and dynamical systems, their classification, and practical application”, state registration No. 0119U102376), 2019–2020
- Scholarship of the Akhiezer Foundation, 2019
- Grant of the State Fund for Fundamental Research (project “Operator-Differential Equations and Their Applications to Problems of Physics”, project No. F83/82-2018), 2018
- Scholarship of the National Academy of Sciences of Ukraine for young scientists, 2017–2018
- Scholarship of the Akhiezer Foundation, 2014

TRAVEL GRANTS

- 27th International Conference in Operator Theory, Timisoara, Romania, 2018
- Trilateral German-Russian-Ukrainian Summer School “Spectral Theory, Differential Equations and Probability”, Mainz, Germany, 2016

LIST OF PUBLICATIONS

The papers

1. Filipkovskaya M.S. (2021). *Global solvability of time-varying semilinear differential-algebraic equations, boundedness and stability of their solutions. II*, Differential Equations, Vol. 57, No. 2, pp. 196–209. <https://doi.org/10.1134/S0012266121020099>
2. Filipkovskaya M.S. (2021). *Global solvability of time-varying semilinear differential-algebraic equations, boundedness and stability of their solutions. I*, Differential Equations, Vol. 57, No. 1, pp. 19–40. <https://doi.org/10.1134/S0012266121010031>
3. Filipkovska (Filipkovskaya) M. (2020). *Existence, boundedness and stability of solutions of time-varying semilinear differential-algebraic equations*, Global and Stochastic Analysis, Vol. 7, No. 2, pp. 169–195.
4. Filipkovska M.S., Kotlyarov V.P. (2020). *Propagation of electric field generated by periodic pumping in a stable medium of two-level atoms of the Maxwell-Bloch model*, Journal of Mathematical Physics, Vol. 61, No. 12, pp. 123502-1–123502-31. <https://doi.org/10.1063/5.0020071>
5. Filipkovska (Filipkovskaya) M.S. (2020). *Global boundedness and stability of solutions of nonautonomous degenerate differential equations*, Proceedings of the Institute of Mathematics and Mechanics, National Academy of Sciences of Azerbaijan. Vol. 46, No. 2, pp. 243–271. <https://doi.org/10.29228/proc.31>
6. Filipkovska M.S. *Two combined methods for the global solution of implicit semilinear*

differential equations with the use of spectral projectors and Taylor expansions, Int. J. of Computing Science and Mathematics. (2019) DOI: 10.1504/IJCSM.2019.10025236. [in press]

7. Filipkovska (Filipkovskaya) M.S. (2019). *A block form of a singular pencil of operators and a method of obtaining it*, Visnyk of V.N. Karazin Kharkiv National University. Ser. "Mathematics, Applied Mathematics and Mechanics", Vol. 89, pp. 33–58. <https://doi.org/10.26565/2221-5646-2019-89-04>
8. Filipkovska M.S. (2018). *Lagrange stability of semilinear differential-algebraic equations and application to nonlinear electrical circuits*, Journal of Mathematical Physics, Analysis, Geometry, Vol. 14, No. 2, pp. 169–196. <https://doi.org/10.15407/mag14.02.169>
9. Filipkovska M.S. (2018). *Lagrange stability and instability of nonregular semilinear differential-algebraic equations and applications*, Ukrainian Mathematical Journal, Vol. 70, No. 6, pp. 947–979. <https://doi.org/10.1007/s11253-018-1544-6>
10. Filipkovska M.S., Kotlyarov V.P., Melamedova E.A. (2017). *Maxwell-Bloch Equations without Spectral Broadening: gauge equivalence, transformation operators and matrix Riemann-Hilbert problems*, Journal of Mathematical Physics, Analysis, Geometry, Vol. 13, No. 2, pp. 119–153. <https://doi.org/10.15407/mag13.02.119>
11. Filipkovska M.S. (2015). *Lagrange stability and numerical method for solving semilinear descriptor equations*. Visn. Kharkiv. Nats. Univ. Mat. Model. Inform. Tekh. Avt. Syst. Upr., Vol. 26, No. 1156, pp. 152–167.
12. Filipkovskaya M. (2015). *Global solvability of singular semilinear differential equations and applications to nonlinear radio engineering*, Challenges of modern technology, Vol. 6, No. 1, pp. 3–13.
13. Filipkovskaya M.S. (2014). *The global solvability of the overdetermined singular system of differential-algebraic equations and applications in radiotechnics*, Radioelectronics & Informatics, No. 1(64), pp. 7–16.
14. Filipkovskaya M.S. (2014). *Global solvability of the underdetermined singular system of differential-algebraic equations*, Proceedings of Voronezh State University, Ser.: Physics. Mathematics, No. 3, pp. 168–181. <http://www.vestnik.vsu.ru/pdf/physmath/2014/03/2014-03-15.pdf>
15. Rutkas A.G., Filipkovskaya M.S. (2013). *Global solvability of the differential-algebraic equations of nonlinear electric circuits*, Zh. Obchysl. Prykl. Mat. [Journal of Computational and Applied Mathematics], No. 4, pp. 131–142. http://nbuv.gov.ua/UJRN/jopm_2013_4_17
16. Rutkas A.G., Filipkovskaya M.S. (2013). *Extension of solutions of one class of differential-algebraic equations*, Zh. Obchysl. Prykl. Mat., No. 1, pp. 135–145. http://nbuv.gov.ua/UJRN/jopm_2013_1_17
17. Filipkovskaya M.S. (2012). *Continuation of solutions of semilinear differential-algebraic equations and applications in nonlinear radiotechnics*, Visn. Kharkiv. Nats. Univ. Mat. Model. Inform. Tekh. Avt. Syst. Upr., Vol. 19, No. 1015, pp. 306–319.

PARTICIPATION AT SOME CONFERENCES AND SYMPOSIUMS

- International scientific conference “Modern problems of Differential Equations and their application” (Chernivtsi, Ukraine, 2020)
- International conference “Modern Problems of Mathematics and Mechanics” (Baku, Azerbaijan, 2019)
- International Conference of Young Mathematicians (Kyiv, Ukraine, 2019)
- 6th Ya. B. Lopatynsky International School-Workshop on Differential Equations and Applica-

tions (Vinnytsia, Ukraine, 2019)

- 27th International Conference in Operator Theory (Timisoara, Romania, 2018)
- International Conference “Computer modelling in high tech (CMHT-2018)” (Kharkiv, Ukraine, 2018)
- International Conference “Differential Equations, Mathematical Physics and Applications” (Cherkasy, Ukraine, 2017)
- International Conferences “Analysis and Mathematical Physics” (Kharkiv, Ukraine, 2015, 2016, 2017)
- Trilateral German-Russian-Ukrainian Summer School “Spectral Theory, Differential Equations and Probability” (Mainz, Germany, 2016)
- 5th International Conference for Young Scientists on Differential Equations and Applications dedicated to Yaroslav Lopatynsky (Kyiv, Ukraine, 2016)
- XVII International Symposium “Methods of Discrete Singularities in Problems of Mathematical Physics” (Sumy, Ukraine, 2015)
- International scientific-practical conference “Information technologies: science, engineering, technology, education, health” (MicroCAD-2015) (Kharkiv, Ukraine, 2015)
- I.I. Lyashko International Scientific Conferences “Computational and Applied Mathematics” (Kyiv, Ukraine, 2013, 2014, 2015)
- International Conference “Voronezh Winter Mathematical School of S.G. Crane - 2014” (Voronezh, Russia, 2014)
- International Conference and School-Conference “Tarapov readings – 2012” and “Tarapov readings – 2013” (Kharkiv, Ukraine, 2012, 2013)
- International conferences “Modern Problems of Mathematics and its Applications in the Natural Sciences and Information Technologies” (Kharkiv, Ukraine, 2011, 2013)

LANGUAGES

English: fluent

Russian: native speaker

Ukrainian: native speaker

ADDITIONAL INFORMATION

- **The Google Scholar profile:** https://scholar.google.com.ua/citations?user=RYPow_kAAAAJ&hl=ru
- Member of Kharkiv Mathematical Society