

CURRICULUM VITAE

1. Name: Victor V. TYUTIN

2. Date of birth: 1 October, 1973.

3. Place of birth: Gorky (now Nizhny Novgorod).

4. Citizenships: Russian.

5. Affiliation: National Research University Higher School of Economics. E-mail: vtyutin@hse.ru

6. Education: Department of Radiophysics, Nizhny Novgorod State University (Lobachevsky State University of Nizhni Novgorod), Russia, 1995.

7. Academic qualification:

2003, November: Assistant professor in Mathematics, (certified in Russia).

1999, March: PhD in Physics and Mathematics, spatiality – radiophysics, Nizhny Novgorod State University

1995, June: Master Degree in Radiophysics and Electronics, Nizhny Novgorod State University

8. Research interests:

- dynamics of short intensive wave packets and solitons in plasma, fiber optics and on surface of deep water;
- developing of higher order approximation of the nonlinear dispersion wave theory.

9. Employment history:

September 2002 – *present time:* National Research University Higher School of Economics Nizhny Novgorod, assistant professor

September 1999 – august 2002: National Research University Higher School of Economics Nizhny Novgorod, senior lecturer

September 1997 – august 1999: Nizhny Novgorod State Technical University, lecturer

September 1995 – December 2006: Institution of Applied Physics Russian Academy of Science (junior researcher)

10. Externally Funded Research Grants:

- Grant of International Soros Science Foundation (for graduate student), 1998;
- Grant of the Russian Foundation for Basic Research, 1996, No. 96-02-19609-a. Investigator;
- Grant of the INTAS, 1996, No. 96-2370. Investigator;
- Grant of the Russian Ministry of Higher Education for basic research in mathematics, 1998. Investigator;
- Grant of the Russian Foundation for Basic Research, 2000, No. 00-02-16596-a. Investigator;
- Grant of the Russian Foundation for Basic Research, 2000, No. 00-15-96772-a. Principal Investigator;
- Grant of the Russian Foundation for Basic Research, 2004, No. 04-02-16393-a. Investigator;
- Grant of the Russian Foundation for Basic Research, 2014, No. 14-05-00565-a. Investigator;
- Grant of the Russian Foundation for Basic Research, 2015, No. 15-02-01919-a. Investigator;

Personal Statement

My experience in the field of general theory of strong **nonlinear waves** is related with dynamics of short intensive wave packets and solitons and developing of higher order approximation of the nonlinear dispersion wave theory with taking into account effects of stimulated scattering, nonlinear dispersion, higher-order linear dispersion.

In particular, in these areas I have the following results:

1. New unique type of exact soliton solution (particular type) within the framework of third-order nonlinear Schrödinger equation (NLSE-3) which includes nonlinear dispersion and third-order linear dispersion (TOD) [**V.V. Tyutin**, Envelope solitons in the third-order approximation equation of nonlinear wave dispersion theory, Radiophysics and Quantum Electronics, V.40, N.7, P.584-580 (1997); E.M. Gromov, **V.V. Tyutin**, Stationary waves in a third-order nonlinear Schrodinger equation, Wave Motion V.28, No.1, P.13, (1998)] was found.

2. I have also developed sophisticated methods, based on the complex analysis, for the study of the soliton stability [E.M. Gromov, L.V. Piskunova, and **V.V. Tyutin**, Dynamics of wave packets and solitons interaction in terms of the third-order nonlinear Schrodinger equation, Radiophysics and Quantum Electronics 41, No. 12, 1051-1055 (1998); E.M. Gromov, L.V. Piskunova, **V.V. Tyutin**, Dynamics of wave packets in the frame of

third-order nonlinear Schrödinger equation, Phys. Lett. A 256, issue: 2-3, 153-158 (1999)] and other aspects of the soliton dynamics [E.M. Gromov, D.E. Vorontzov, **V.V. Tyutin**, Short intense wave packets in smoothly inhomogeneous media, Phys. Lett. A 257, issue: 3-4, 182-188 (1999); E.M. Gromov, L.V. Piskunova, **V.V. Tyutin**, D.E. Vorontzov, Interaction of envelope short solitons with external wave fields, Phys. Lett. A 273, issue: 5-6, 338-344 (2000)].

Another field of my research interests is the dynamics of narrow high-intensity vectorial solitons, described by systems of coupled extended NLS equations:

3. New unique type of exact narrow high-intensity vectorial solitons solution within the framework of systems of coupled extended NLS equations [E.M. Gromov, **V.V. Tyutin**, D.E. Vorontzov, Short vector soliton, Phys. Lett. A, 2001, v.287, issue 3-4, p.233-239; E.M. Gromov, Piskunova L.V., **V.V. Tyutin**, D.E. Vorontzov, Short vector envelope soliton, Radiophysics and Quantum Electronics 45, No.7, 561-570 (2002)] was found.

4. I have investigate the stability and dynamics of of narrow high-intensity vectorial solitons within the framework of system of coupled extended NLS equations [N.V. Aseeva, E.M. Gromov, **V.V. Tyutin**, Phase interaction of short vector solitons, Phys. Lett. A 376, 718-722 (2012); N.V. Aseeva, E.M. Gromov, **V.V. Tyutin**, Interaction of short single-component vector solitons, Radiophysics and Quantum Electronics 55, No.3, 184-197 (2012)].

5. My current area of interests includes the dynamics of narrow high-frequency solitons in media with induced scattering on damping low-frequency waves (pseudo stimulated Raman scattering). I have found a new class of asymptotic soliton solutions within the framework of an inhomogeneous extended NLS equation which includes effects of pseudo stimulated Raman scattering [N.V. Aseeva, E.M. Gromov, **V.V. Tyutin**, Soliton dynamics in media with space stimulated Raman scattering and synchronic spatial variation of dispersion and self-phase modulation, Chaos 23, issue 1, article number: 013143 (2013); Aseeva N.V., Gromov E.M., Malomed B.A., **Tyutin V.V.**, Soliton dynamics in an extended nonlinear Schrödinger equation with inhomogeneous dispersion and self-phase modulation, Communications in Mathematical Analysis, 2014, v.17, N 2, pp. 1-13; Gromov E.M., **Tyutin V.V.**, Kink Waves in an Extended Nonlinear Schrödinger Equation with Allowance for Stimulated Scattering and Nonlinear Dispersion, *Radiophysics and Quantum Electronics*. 2014. Vol. 57. No. 4. P. 279-286; N.V. Aseeva, E.M. Gromov, **V.V. Tyutin**, Solitons in an extended nonlinear Schrodinger equation with pseudo stimulated scattering and inhomogeneous self-phase modulation, *Radiophysics and Quantum Electronics*. 2015. Vol. 58. No. 3]. Such soliton solutions exist as a result of the equilibrium of stimulated scattering and inhomogeneity of the dispersion parameters (second-order dispersion and/or self-phase modulation).

11. Selected Peer-reviewed Publications

1. Aseeva N.V., Gromov E.M., **Tyutin V.V.** High-frequency solitons in a media with induced scattering on damping low-frequency waves and inhomogeneous dispersion and nonlinearity. *JETP*, 2015, v.121, N 5 (accepted).
2. Aseeva N.V., Gromov E.M., **Tyutin V.V.** Solitons in an extended nonlinear Schrödinger equation with pseudo stimulated scattering and inhomogeneous self-phase modulation. *Radiophysics and Quantum Electronics*. 2015. Vol. 58. No. 3
3. Aseeva N.V., Gromov E.M., Malomed B.A., **Tyutin V.V.** Soliton dynamics in an extended nonlinear Schrödinger equation with inhomogeneous dispersion and self-phase modulation, *Communications in Mathematical Analysis*, 2014, v.17, N 2, pp. 1-13.
4. Gromov E.M., **Tyutin V.V.** Kink waves in an extended nonlinear Schrödinger equation with allowance for stimulated scattering and nonlinear dispersion. *Radiophysics and Quantum Electronics*, 2014, v.57, N 4, pp. 279-286.
5. N.V. Aseeva, E.M. Gromov, **V.V. Tyutin**, Soliton dynamics in media with space stimulated Raman scattering and synchronic spatial variation of dispersion and self-phase modulation, *Chaos* 23, issue 1, article number: 013143 (2013)
6. N.V. Aseeva, E.M. Gromov, **V.V. Tyutin**, Phase interaction of short vector solitons, *Phys. Lett. A* 376, 718-722 (2012)
7. E.M. Gromov, **V.V. Tyutin**, D.E. Vorontzov Short vector soliton, *Phys. Lett. A*, 2001, v.287, issue 3-4, p.233-239;
8. E.M. Gromov, Piskunova L.V., **V.V. Tyutin**, D.E. Vorontzov, Short vector envelope soliton, *Radiophysics and Quantum Electronics* 45, No.7, 561-570 (2002)
9. E.M. Gromov, L.V. Piskunova, and **V.V. Tyutin**, Dynamics of wave packets and solitons interaction in terms of the third-order nonlinear Schrodinger equation, *Radiohysics and Quantum Electronics* 41, No. 12, 1051-1055 (1998);
10. E.M. Gromov, L.V. Piskunova, **V.V. Tyutin**, Dynamics of wave packets in the frame of third-order nonlinear Schrödinger equation, *Phys. Lett. A* 256, issue: 2-3, 153-158 (1999)
11. E.M. Gromov, D.E. Vorontzov, **V.V. Tyutin**, Short intense wave packets in smoothly inhomogeneous media, *Phys. Lett. A* 257, issue: 3-4, 182-188 (1999);
12. E.M. Gromov, L.V. Piskunova, **V.V. Tyutin**, D.E. Vorontzov, Interaction of envelope short solitons with external wave fields, *Phys. Lett. A* 273, issue: 5-6, 338-344 (2000)

13. **V.V. Tyutin**, Envelope solitons in the third-order approximation equation of nonlinear wave dispersion theory, Radiophysics and Quantum Electronics, V.40, N.7, P.584-580 (1997)

14. E.M. Gromov, **V.V. Tyutin**, Stationary waves in a third-order nonlinear Schrodinger equation, Wave Motion V.28, No.1, P.13, (1998)

12. Participation in International Conferences and Schools as invited

1. Intern. Seminar "Day on Diffraction 97", SPB, 3-5 June 1997. Place of publication: Gromov E.M., **Tyutin V.V.** "Frequency modulated stationary waves in third-order nonlinear Schrodinger equation, In book: Diffraction Day 97. SPB: SPB University Press, 1997, p. 23-24.

2. 1998 International Congress on Plasma Physics, Zofin, Prague, Czech Republic, June 29 - July 3 1998; Place of publication: Gromov E.M., **Tyutin V.V.**, "Short intense high-frequency wave packets and solitons in plasma", book of abstracts, P.762.

3. Int. Workshop "Solitons, collapses and turbulence: achievements, developments and perspectives", august 3-10 (1999), Landau Inst. for Theoretical Physics, Chernogolovka, Russia. Place of publication: Gromov E.M., **Tyutin V.V.**, Vorontzov D.E., "Motion of short intense wave packets in inhomogeneous media", Abstracts.

4. Int. Workshop "Solitons, collapses and turbulence: achievements, developments and perspectives", august 3-10 (1999), Landau Inst. for Theoretical Physics, Chernogolovka, Russia. Place of publication: Gromov E.M., Piskunova L.V., **Tyutin V.V.**, "Short intense wave packets and solitons in dispersive media", Abstracts.

5. Int. conference PROGRESS IN NONLINEAR SCIENCE, Nizhny Novgorod, Russia, July 2-6 2001. Place of publication: Gromov E.M., **Tyutin V.V.**, Vorontzov D.E. Short vector solitons, abstracts, p.185-186.

6. Int. conference PROGRESS IN NONLINEAR SCIENCE, Nizhny Novgorod, Russia, July 2-6 2001. Place of publication: Gromov E.M., Korobov A.S., **Tyutin V.V.**, "Dynamics of short solitons in nonconservative media", abstracts, p.186-187.

7. 6-th Int. conference CHAOS'01, 2-7 october 2001, Saratov, Russia. Place of publication: Gromov E.M., Shabalina E.V., **Tyutin V.V.**, "Stationary waves in the frame of generalized third-order nonlinear Schrodinger equation", Book of abstract, p. 28.

8. Int. conference PROGRESS IN NONLINEAR SCIENCE, Nizhny Novgorod, Russia, 2002. Place of publication: Gromov E.M., **Tyutin V.V.**, Vorontzov D.E. «Adiabatic interaction of the short envelope solitons», abstracts, p.74-78.

9. Int. conference PROGRESS IN NONLINEAR SCIENCE, Nizhny Novgorod, Russia, 2002. Place of publication: Gromov E.M., Korobov A.S., **Tyutin V.V.**, "Dynamics of short envelope solitons in nonconservative media", abstracts, p.58-63.
10. Int. symposium "Topical Problems of Nonlinear Waves Physics", Nizhny Novgorod, Institute of Applied Physics RAS, 2003. Place of publication: Gromov E.M., Piskunova L.V., **Tyutin V.V.**, Vorontzov D.E "Dynamics of vector wave packets in the frame of the coupled third-order nonlinear Schrodinger equation", abstracts.
11. VI Int. congress on Mathematical Modeling, , University of Nizhny Novgorod, 2004. Place of publication: Gromov E.M., **Tyutin V.V.**, Vorontzov D.E. «short vector solitons with phase modulation», abstracts, p.156.
12. III international conference FNP-2007, july 3-9 2007, N.Novgorod. Place of publication: Aseeva N.V., Gromov E.M., **Tyutin V.V.**, "Short envelope solitons in media with controlled dispersion", abstracts.