Curriculum viatae

Dr. Stepan Tkachev

Occupation & Affiliation:

Senior Scientist at Keldysh Institute of Applied Mathematics RAS (full-time position) (KIAM).

Associate professor of the Theoretical Mechanics Chair at Moscow Institute of Physics and Technology (part-time position) (MIPT).

Field of interest

Gyroscopic systems, attitude control, remote sensing, relative motion control, flexible element, mathematical modeling

Education

Bachelor degree in applied physics and mathematics at MIPT, 2006

Master degree in applied physics and mathematics at MIPT, 2008

PhD degree in physics and mathematics at KIAM, 2011

Associate professor of theoretical mechanics, 2017

Experience

Engaged in attitude control system development for microsatellite Chibis-M.

Studied analytically and numerically of gyroscopic attitude control system dynamics for Chibis-M (Space Research Institute, Sputnix, Russia), TabletSat (Sputnix, Russia), Mjolnir (Swedish Institute of Space Physics, Sweden).

Analytically studied effect of disturbances relative motion of two satellite in formation flying.

Developed and implemented the software for precision orbital and angular motion modeling.

Development of mathematical model for angular motion of FORMOSAT-2 (NSPO, Taiwan).

Engaged in development of the Test-Bench COSMOS for Microsatellite Control System Mock-Ups Modeling and Survey

Papers in WoS journals

1. M.Yu.Ovchinnikov, S.S.Tkachev. Determination of Two Satellites' Relative Motion Using Tracking Measurements, Cosmic Research, 2008, Vol.46, No.6, pp.553-558.
   URL: https://link.springer.com/article/10.1134/S0010952508060075

2. M.Yu.Ovchinnikov, D.S.Ivanov, S.S.Tkachev, Attitude Control of a Rigid Body Suspended by String with the Use of Ventilator Engines, Journal of Computer and Systems Sciences International, 2011, Vol.50, No.1, pp.104-116.
   URL: https://link.springer.com/article/10.1134/S1064230711010114
3. D.S. Ivanov, S.O. Karpenko, M.Yu. Ovchinnikov, D.S. Roldugin, S.S. Tkachev, Testing of attitude control algorithms for microsatellite “Chibis-M” at laboratory facility // Journal of Computer and Systems Sciences International, 2012, V. 51, N 1, pp. 106-125.
   URL: http://link.springer.com/article/10.1134%2FS0010952514020038
4. M.Yu.Ovchinnikov, S.S.Tkachev, S.O.Karpenko, A Study of the Angular Motion of the Chibis-M Microsatellite with Three Axis Flywheel Control, Cosmic Research, 2012, V.50, No 6. 462-467.
   URL: https://link.springer.com/article/10.1134/S0010952512060044
5. S.O.Karpenko, M.Yu.Ovchinnikov, D.S.Roldugin, S.S.Tkachev. One-Axis Attitude of Arbitrary Satellite Using Magnetorquers Only. Cosmic Research, 2013, Vol.51, No.6, P. 478-483.
   URL: https://link.springer.com/article/10.1134/S0010952513060087
6. M.Ovchinnikov, D. Ivanov, N. Ivlev, S. Karpenko, D. Roldugin, S. Tkachev. Development, integrated investigation, laboratory and in-flight testing of Chibis-M microsatellite ADCS // Acta Astronautica, V. 93, 2014. P. 23-33.
   URL: http://www.sciencedirect.com/science/article/pii/S0094576513002312
7. D.S. Ivanov, N.A. Ivlev, S.O. Karpenko, M.Yu. Ovchinnikov, D.S. Roldugin, S.S. Tkachev, The results of flight tests of an attitude control system for the Chibis-M microsatellite // Cosmic Research, 2014, V. 52, N 3, pp. 205-215.
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8. S.O.Karpenko, M.Yu.Ovchinnikov, D.S.Roldugin, S.S.Tkachev. New one-axis one-sensor magnetic attitude control theoretical and in-flight performance // Acta Astronautica, V. 105, 2014, N 1, pp. 12-16
   URL: http://www.sciencedirect.com/science/article/pii/S0094576514003245
9. M.Yu. Ovchinnikov, D.S. Roldugin, V.I. Penkov, S.S. Tkachev, Y.V. Mashtakov, Fully magnetic sliding mode control for acquiring three-axis attitude // Acta Astronautica, 2016, V. 121, pp. 59-62.
   URL: http://www.sciencedirect.com/science/article/pii/S009457651530120X
10. R.V.Yelnikov, Y.V.Mashatkov, M.Yu.Ovchinnikov, S.S.Tkachev, Orbital and angular motion construction for low thrust interplanetary flight // Cosmic Research, 2016, V.54, N 6, pp. 483-490.

URL: https://link.springer.com/article/10.1134/S0010952516060113

11. M.Yu.Ovchinnikov, S.S.Tkachev, D.S.Roldugin, A.B.Nuralieva, Y.V.Mashtakov, Angular motion equations for a satellite with hinged flexible solar panel // Acta Astronautica, 2016, V.128, pp.534-539.
    URL: http://www.sciencedirect.com/science/article/pii/S0094576515301223
12. Y.V.Mashtakov, M.Yu.Ovchinnikov, S.S.Tkachev, Study of the disturbances effect on small satellite route tracking accuracy // Acta Astronautica, 2016, V.129, pp.22-31.
    URL: http://www.sciencedirect.com/science/article/pii/S009457651630594X
13. D.S.Ivanov, M.D.Koptev, Y.V.Mashtakov, M.Yu.Ovchinnikov, N.N.Proshunin, S.S.Tkachev, A.I.Fedoseev, M.O.Shachkov. Determination of disturbances acting on small satellite mock-up on air bearing table // Acta Astronautica, 2018, V.142, pp.265-276.
    URL: https://www.sciencedirect.com/science/article/pii/S0094576517307890
14. M.Yu. Ovchinnikov, D.S. Roldugin, S.S. Tkachev, V.I. Penkov. B-dot algorithm steady-state motion performance // Acta Astronautica, 2018, V. 146, pp. 66-72.
    URL: https://www.sciencedirect.com/science/article/pii/S0094576517317332
15. Ya.V.Mashtakov, M.Yu. Ovchinnikov, S.S. Tkachev. Use of External Torques for Desaturation of Reaction Wheels // Journal of Guidance, Control, and Dynamics, 2018, V. 41, No. 8, pp. 1663-1674.
    URL: https://arc.aiaa.org/doi/abs/10.2514/1.G003328
16. Y.Machtakov, M.Ovchinnikov, S.Tkachev, M,Shachkov. Lyapunov based attitude control algorithm for slew maneuvers with restrictions // Advances in the Astronautical Sciences, 2018, V. 163, pp. 355-364.
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17. D.Ivanov, M.Koptev, M.Ovchinnikov, S.Tkachev, N.Proshunin, M.Shachkov. Flexible microsatellite mock-up docking with non-cooperative target on planar air bearing test bed // Acta Astronautica, 2018, V. 153, pp. 357-356.
    URL: https://www.sciencedirect.com/science/article/pii/S009457651731370X
18. М.Ю.Овчинников, С.С.Ткачев, А.И.Шестоперов. Алгоритмы стабилизации космического аппарата с нежесткими элементами // Известия РАН. Теория и системы управления, 2019, №3, с. 147-163
    URL: https://link.springer.com/article/10.1134/S1064230719030146
19. D.S. Ivanov, M.Yu. Ovchinnikov, D.S. Roldugin, S.S. Tkachev, S.P. Trofimov, S.A. Shestakov, M.G. Shirobokov, Software Package for Simulating the Angular and Orbital Motion of a Satellite // Mathematical models and Computer Simulations, 2020, V. 12, N 4, pp. 44-56

URL: https://link.springer.com/article/10.1134/S2070048220040109

20. A.S. Okhitina, Y.V. Mashtakov, S.S. Tkachev, S.A. Shestakov, M.Y. Ovchinnikov, Minimal Thrusters Configuration for Simultaneous Orbit Correction and Reaction Wheels Desaturation for GEO Satellite // Cosmic Research, 2020, 58(5), pp. 379–392
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21. A. Okhitina, Y. Mashtakov, S. Tkachev. Distribution of correction thrusters under delta-v constraints in local horizontal plane // Advances in the Astronautical Sciences, 2020, 170, pp. 203–211
22. Y.V. Mashtakov, T.Y. Petrova, S.S. Tkachev. Relative motion control of two satellites by changing the reflective properties of the solar sails surface // Advances in the Astronautical Sciences, 2020, 170, pp. 399–416
23. M.Y. Ovchinnikov, V.I. Penkov, D.S. Roldugin, S.S. Tkachev, Single axis stabilization of a fast rotating satellite in the orbital frame using magnetorquers and a rotor // Acta Astronautica, 2020, 173, pp. 195–201
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24. Y. Mashtakov, M. Ovchinnikov, T. Petrova, S. Tkachev, Two-satellite formation flying control by cell-structured solar sail// Acta Astronautica, 2020, 170, pp. 592–600
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25. A.D. Guerman, D.S. Ivanov, D.S. Roldugin, S.S. Tkachev, A.S. Okhitina, Orbital and Angular Dynamics Analysis of the Small Satellite SAR Mission INFANTE //Cosmic Research, 2020, 58(3), pp. 206–217
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26. Y. Mashtakov, M. Ovchinnikov, S. Tkachev, S. Shestakov, Single-axis attitude control for slew maneuvers with the keep-out zones // Acta Astronautica, 2021, 180, pp. 527–537
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Conferences

1. M.Ovchinnikov, N.Kupriyanova, S.Tkachev, Development, Simulation and Flight Testing of Attitude Control Systems for Technological Nanosatellites. 2nd International Workshop on Spaceflight Dynamics and Control, Covilha, UBI, October 09-11, 2006, 1p.
2. M.Yu.Ovchinnikov, S.O.Karpenko, A.S.Serednitskiy, S.S.Tkachev and N.V.Kupriyanova, Laboratory Facility for Attitude Control System Validation and Testing, Digest of the 6th International Symposium of IAA "Small Satellites for Earth Observation", 23-26 April, 2007, Berlin, Germany, Paper IAA-B6-0508P, pp.137-140.

3. D. Ivanov, M. Ovchinnikov, D. Nuzhdin, S. Tkachev. Balloon's payload attitude control system with propeller thruster use. // Proceedings of Taiwan-Russian bilateral symposium on problems in advanced mechanics. M.: MSU, 2010. P. 85-92.
4. D.S. Ivanov, M.Yu.Ovchinnikov, S.S. Tkachev. Ballon payload attitude control system// Proceedings of the 1st IAA Conference on University Satellites Mission and CubeSat Workshop, 24-29th January, 2011, Roma, Italy, IAA-CU-11-04-02, p.84.
5. M. Yu. Ovchinnikov, D. S. Ivanov, S.S. Tkachev, S.S. Roldugin, S.O. Karpenko. simulation and laboratory testing of microsatellite 'Chibis_M' attitude control system// Proceedings of the 1st IAA Conference on University Satellites Mission and CubeSat Workshop, 24-29th January, 2011, Roma, Italy, IAA-CU-11-04-06, p.88
6. M.Ovchinnikov, D.Ivanov, N.Ivlev, S.Karpenko, D. Roldugin, S.Tkachev. Delelopment, Complex Investigation, Laboratory and Flight Testing of the Magneto-Guroscopic ACS for the Microsatellite// Digest of the 63th International Astronautical Congress, Naples, Italy. IAC-12-C1.9.12, 15 p.
7. D.S. Roldugin, S.S. Tkachev, S.O. Karpenko. New algorithms for the fully magnetic attitude control system // Digest of the 9th IAA Symposium "Small satellites for Earth observation", Berlin, April 2013, pp. 179-183. (ISBN 978-3-89685-574-9)
8. M.Yu. Ovchinnikov, D.S. Ivanov, N.A. Ivlev, D.S. Roldugin, S.S. Tkachev, S.O. Karpenko. "Chibis-M" microsatellite ACS development, complex investigation, laboratory and flight testing // Digest of the 9th IAA Symposium "Small satellites for Earth observation", Berlin, April 2013, pp. 441-444. (ISBN 978-3-89685-574-9)
9. S.Tkachev «The Lyapunov control law design for space systems (satellite with 2DOF solar panel, formation flying with Coulomb control)» на конференции 9th International workshop and advanced school "Spaceflight dynamics and control", Covilha, Portugal, 2013.
10. M.Ovchinnikov, S.Karpenko, D. Roldugin, S.Tkachev. New one-axis magnetic attitude control in absence of magnetometer readings // Digest of the 65th International Astronautical Congress, Toronto, Canada. IAC-14-C1.3.1, 8 p.
11. M.Yu. Ovchinnikov, D.S. Roldugin, V.I. Penkov, S.S. Tkachev, Y.V. Mashtakov. Sliding mode control for three-axis magnetic attitude // Proceedings of the 10th IAA Symposium "Small satellites for Earth observation", Berlin, April 2015, pp. 385-388. (ISBN 978-3-89685-575-6)
12. Y.V. Mashtakov, S.S. Tkachev. Angular motion synthesis for remote sensing satellite // Digest of the 10th IAA Symposium "Small satellites for Earth observation", Berlin, April 2015, pp. 397-400. (ISBN 978-3-89685-575-6)

13. Hao-Chi Chang, M.Yu. Ovchinnikov, Shui-Lin Weng, S.S. Tkachev, Yu-Yung Lian, S.A. Mirer, Wen-Lung Chian, D.S. Roldugin, Chen-Tsung Lin. Attitude estimation and control for single steerable wing satellite // Proceedings of the 66th International Astronautical Congress, Jerusalem , 12-16 October, 2015, 8 p (IAC-15-C1.5.2).
14. Y.Mashtakov, S.Tkachev, M.Ovchinnikov. Analytical study of the disturbances effect on the remote sensing image quality // Proceedings of the 3rd IAA Conference on University Satellite Missions & Cubesat Workshop. Rome, Italy, November 30th – December 5th. IAA Book Series, Vol. 2 №4, Conference and Symposium Proceedings. 2016. pp 251-264.
15. M.Yu. Ovchinnikov, D.S. Roldugin, S.S. Tkachev, Study of the accuracy of active magnetic damping algorithm // 3rd IAA Conference on Dynamics and Control of Space Systems, Moscow, May 30 – June 1 2017 (IAA-AAS-DyCoSS3-003).
16. Y.V.Mashtakov, S.S. Tkachev, M.Yu. Ovchinnikov, Fuelless means of reaction wheels desaturaton // 3rd IAA Conference on Dynamics and Control of Space Systems, Moscow, May 30 – June 1 2017 (IAA-AAS-DyCoSS3-075).
17. Y.V. Mashtakov, M.Yu. Ovchinnikov, S.S. Tkachev. Usage of solar and gravitational torques for reaction wheels desaturation// Proceedings of the 68th Inetrnational Astronautical Congress, 2017, p. 9 (IAC-17-C1.2.3).
18. Y.V. Mashtakov, M.Yu. Ovchinnikov, S.S. Tkachev, M.O.Shachkov. Lyapunov based attitude control algorithm for slew maneuvers with restrictions // Proceedings of 4th IAA Conference on University Satellite Missions and CubeSat Workshop, 2017, p. 10 (IAA-AAS-CU-17-05-08)
19. D. Ivanov, M. Koptev, M. Ovchinnikov, S. Tkachev, N. Proshunin, M. Shachkov. Flexible Microsatellite Mock-Up Docking With Noncooperative Target On Air Table// Proceedings of 9th International Workshop on Satellite Constellations and Formation Flying, 20-22 June 2017, Boulder, Colorado, United States, Paper IWSCFF 17-29, 20p.
20. Y.V. Mashtakov, M.Yu. Ovchinnikov, T.Yu.Petrova S.S. Tkachev. Attitude and relative motion control of satellites in formation flying via solar sail with variable reflectivity properties // Proceedings of the 69th Inetrnational Astronautical Congress, 2018, 8 p. (IAC-18-C1.5.7).
21. Y.V. Mashtakov, S.S. Tkachev, S.A.Shestakov. Lyapunov control for attitude maneuvers with restricted areas// Proceedings of the 69th Inetrnational Astronautical Congress, 2018, 6 p. (IAC-18-C1.4.7).
22. D. Ivanov, S. Meus, A. Nuralieva, A. Ovchinnikov, M. Ovchinnikov, D. Roldugin, S. Tkachev, A. Shestoperov, S. Shestakov, and E. Yakimov. Coupled Motion Determination and Stabilization of a Satellite Equipped with Large Flexible Elements Using ADCS Only //

Proceedings of International Astronautical Congress, 21-25 October 2019, Washington, USA. Paper IAC-19.C1.5.9, 7p.

23. A.S. Okhitina, D.S. Roldugin, S.S. Tkachev, Biologically inspired optimization algorithm in satellite attitude control problems // 15th International Conference on Stability and Oscillations of Nonlinear Control Systems (Pyatnitskiy's Conference) (STAB), June 3-5, 2020, Moscow, Russia
    URL: https://ieeexplore.ieee.org/document/9140565

Education Activity

Associate Professor of Moscow Institute of Physics and Technology (MIPT) theoretical mechanics chair
Founder and one of the lectors of the novel course "Numerical modeling of the satellite angular motion" of "Mathematical modeling and applied mathematics" chair
http://keldysh.ru/microsatellites/education/courses.html and special course "Dynamics and control of complex mechanical systems" in the Innovation laboratory "Control and dynamics of complex intelligential mechanical systems" created at MIPT if the frame of Innovation educational program "High technology and innovation economics"
http://teormech.mipt.ru/laboratory/
New course "Satellite gyroscopic attitude control systems" for University of Brasilia (Brazil) is developed.

Scientific superviser and science advisor for bachelor, master degree and PhD students of MIPT.
http://www.keldysh.ru/microsatellites/Bachelor_Thesis_Dosaev.pdf
http://www.keldysh.ru/microsatellites/Bachelor_Thesis_Shestoperov.pdf
http://www.keldysh.ru/microsatellites/Master_Thesis_Mashtakov.pdf
http://www.keldysh.ru/microsatellites/Master_Thesis_Ilyin.pdf
http://www.keldysh.ru/microsatellites/Bachelor_Thesis_Iliyin.pdf
http://www.keldysh.ru/microsatellites/Bachelor_Thesis_Mashtakov.pdf

Projects Participation

Russian Science Foundation
– Grant № 17-71-20117 “New attitude control methods of small satellites under restrictions” of the Russian Science Foundation, 2017-2020, **PI**
– Grant № 17-71-20117-extended “New attitude control methods of small satellites under restrictions” of the Russian Science Foundation, 2020-2022, **PI**
– Grant № 14-11-00621 “Development of new dynamical models and control algorithms for the orbital and attitude motion of small spacecraft in prospective missions to Moon, planets, and small bodies of Solar System” of the, 2014-2018, I

Contract with Rosnauka:

N 02.514.11.4011

N 02.434.11.7061

N 02.700.12.050

Contracts with Ministry of Education and Science

– Contract N 02.740.11.0860 with the Ministry of Sciences and Education of RF «Design and study of guided obital and controlled attitude motion of small satellites in formation flight using thrusters of a new generation" (code "2010-1.1-234-069-040"), 2010-2012, I

– State Agreement № 8182 with the Ministry of Educationa and Science of Russian Federation «Development and Verification of Economical Ways of Controlable Deorbiting of Miscrosatellites from Conventional Near-Earth Orbits» (code "2012-1.1-12-000-2004-022"), 2012-2013, I

– JSC «Russian Space Systems» «Study of Formation and Single Satellite Flight with regard to Information Support and Communication Apparatus Distribution among Satellites» (Code Telepribor-IPM) with , Contract № 016/754-11/2, 2011-2013, I

– State Agreement № 14.607.21.0144 «Methods and tools for laboratory verification of orbital and angular motion of satellites algorithms», 2016-2018, I

RFBR:

–N 17-01-00449, "Study of Spaceflight Orbital and Attitude Dynamics for Formation Flying of Satellites", 2017-2019, I

–N 16-01-00634, "Simulation and motion control of flexible elongated space constructions", 2016-2018, I

–N 13-01-00665-a "Motion study and control algorithms development for dynamic reconfiguration of the microsatellite formation including its de-orbiting", 2013-2015, I;

– N 12-01-33045 "Perspective algorithms and methods of the attitude and orbital motion control for small satellites and their formations" 2013-2015, **PI**

– N 12-01-09318 Travel, **PI**

– N 11-01-09203 Travel, **PI**

– N 15-31-20058 "Precise angular motion control algorithms for small satellite with limited control authority and sensor deficiency", I

– N 10-01-00228 "Mathematical modelling and optimization of finite and infinite dimensional control systems", I

– N 09-01-00431 "Dynamics and Control of Multi-element Mobile Formation under Limitation for Measuring and Control", 2009-2011, I

– N 07-01-92001 "Dynamics and Control of Small Satellites in the Geomagnetic Field", 2007-2009, I

– N 07-01-00040 "Problems of elaboration and testing of small spacecraft attitude control systems on experimental errangement", 2007-2009, I

– N 06-01-10752 Travel, **PI**

– N 06-01-00389 “Guarantee of the motion of small satellites and miniature flight vehicles at incomplete measurements and limited control”, 2006-2008, I

– N 03-01-00652 “Attitute Control of Small-Sized Satellites Based on the MEMS Technology”, 2003-2005, I

Support of Leading Scientific Schools of Russia” by President of Russia

N NSh-2448.2006.1

N NSh-2003.2003.1

N NSh-2020.2010.1

Project N 6827 in the Analytical Program of the Ministry of Education and Science of Russian Federation purposed to the development of a high school research potential in 2006-2008

HPH.com Project № 218862, 7th Framework Program EU, «HeliconPlasmaHydrazine.COmbinedMicro», 2008-2012, I

Industial Contracts

– Lavochkin Research and Production Association, «Study of SC angular motion along transfer Earth-Asteroid”, PI

– JSC Academician M.F. Reshetnev Information Satellite Systems, «Development of control algorithms for attitude orientation and stabilization of SC with non-rigid large structure elements”, 2014-2015, PI

– National Space Organization, Taiwan, Contract № NSPO-S-103132, «Satellite multiple solar panel dynamic model development”, 2014, PI

– National Space Organization, Taiwan, Contract № NSPO-S-102089 «Generic spacecraft dynamic simulation code development", 2013, PI

– JSC NIIEM «Development of magneto-gyroscopic attitude control system within space-based system for radiation environment monitoring in near-Earth space», I;

– JSC «Information Satellite Systems» «Development of control algorithms for attitude orientation and stabilization of SC with non-rigid large structure elements», 2014-2015, I

– R&DC Rezonans Ltd, «Development and verification of the algorithm for landing particle coordinates determination», 2014, I

– «Sputnix» Ltd, «Development of Software for Attitude Control System of «Tabletsat» Microsatellite Series», 2013, I

– «Sputnix» Ltd «Developing the attitude sensors calibration technique and recommendations what to do in falure of during the microsatellite Chibis-M operation», 2011-2012, I

– Contract with Russian ministry of science and education № 14.607.21.0144 «Methods and tools for laboratory verification of orbital and angular motion of satellites algorithms», 2016-2018, I

Awards

– Moscow Government Award for Young Scientists 2015
– Russian Federation President Fellowship for young researchers 2018-2018
– Russian Federation President Fellowship for young researchers 2015-2017
– Russian Federation President Fellowship for young researchers 2012-2014
– Certificate of Merit of the Russian academy of sciences 2013
– Young scientists award at the contest dedicated to the Keldysh Institute of Applied Mathematics of RAS 60-years anniversary (KIAM RAS, 2013).
– Young scientists award at the contest dedicated to M.V. Keldysh 100-years anniversary (KIAM RAS, 2011).

Intellectual property

Software «Software for design and investigation of orbital and angular motion for the single satellites and formation flying with a new generation thrusters», authors: M.Shirobokov, S.Trofimov, M.Ovchinnikov, S.Mirer, S.Tkachev, D.Ivanov, D.Roldugin, M.Sakovich, A.Ilyin. Rightholder: Keldysh Institude of Applied Mathematics RAS. N 2012619690, 10.07.2012. (in Russian)

Software «Software for determination of the celestial sphere monitoring parameters using satellite», authors: D.Roldugin, M.Ovchinnikov, S.Tkachev. Rightholder: Keldysh Institude of Applied Mathematics RAS. N 2014660181, 07.08.2014. (in Russian)

Software «Software for the lifetime calculation of the spacecraft with solar sail affected by gravitational, drag, magnetica and solar forces», authors: D.Roldugin, M.Ovchinnikov, S.Tkachev, S.Trofimov. Rightholder: Keldysh Institude of Applied Mathematics RAS. N 2016619866, 01.07.2016. (in Russian)

Software «Software for planar dynamics simulation of a rigid body with flexible elements, author: D.Roldugin, M.Ovchinnikov, S.Tkachev, D.Ivanov. Rightholder: Keldysh Institude of Applied Mathematics RAS. N 2017615231, 27.07.2017 (in Russian).