

### Education

**ISHLINSKY INSTITUTE FOR PROBLEMS IN MECHANICS OF RAS** Moscow, Russia  
Ph.D., specialty – Fluid Mechanics; Advisor: Dr. Alexey S. Shamaev. 2013

Thesis: Research on effective dynamic characteristics of emulsions and granulated media saturated with liquid.

**LOMONOSOV MOSCOW STATE UNIVERSITY** Moscow, Russia  
Department of Mechanics and Mathematics, Division of Differential Equations 2005

M.Sc. in Mathematics, specialty – Differential Equations; Advisor: Dr. Alexey S. Shamaev.

Thesis: Qualitative properties of solutions of one integro-differential equation of the parabolic type.

### Research Experience

**The Pennsylvania State University, Dept. of Mathematics, Assistant Research Professor** State College, PA, USA  
• mechanics of biofluids 2020-present

**Ishlinsky Institute for Problems in Mechanics of the Russian Academy of Sciences (IPMech RAS), Senior Researcher** Moscow, Russia  
2006-2022

- control problems for distributed parameter systems
- vibration theory
- mechanics of inhomogeneous media

**University of Tromso - The Arctic University of Norway, Campus in Narvik, Guest Researcher** Narvik, Norway  
2017, May

- mechanics of inhomogeneous media

**Steklov Mathematical Institute of the Russian Academy of Sciences, Researcher** Moscow, Russia  
2016-2017

- mechanics of inhomogeneous media

**The University of Rostock, Guest Researcher as a participant of Alexander von Humboldt Linkage Project** Rostock, Germany  
2019, 2018, 2017, 2016, August

- control problems for distributed parameter systems

**Korund-M Design Bureau (KB Korund-M), Senior Engineer** Moscow, Russia  
2010-2013

- diffraction problems

### Teaching Experience

**The Pennsylvania State University, Department of Mathematics** State College, PA, USA  
• Calculus and Vector Analysis (instructor/lecturer) 2023, Spring

• Ordinary Differential Equations (instructor/lecturer) 2022, Fall

• Multivariable Calculus (instructor/lecturer) 2022, Spring

• Calculus and Vector Analysis (instructor/lecturer) 2021, Fall

• Integral Vector Calculus (instructor/lecturer)

• Concepts of Real Analysis (teaching assistant)

• Calculus of Several Variables (instructor/lecturer) 2021, Spring

• Integral Vector Calculus (instructor/lecturer)

• Functional Analysis (teaching assistant)

• Calculus with Analytic Geometry I (instructor/lecturer) 2020, Fall

• Classical Analysis I (teaching assistant)

• Ordinary and Partial Differential Equations (instructor/lecturer) 2020, Spring

• Partial Differential Equations II (teaching assistant)

My current interests are in several branches of applied mathematics and mechanics: optimal control theory, mechanics of inhomogeneous media including mechanics of living matter, and diffraction theory.

Regarding mechanics of inhomogeneous continuum, the classical vibration theory methods as well as homogenization theory, are used in my studies. Currently, I am working on the problems arising in math biology: how bacteria move in biofluids (e.g., mucus) modeled as viscoelastic liquid crystals.

In the field of control theory, I work on optimal control problems for systems with distributed parameters such as vibrating and moving beams, rod-like heat conducting systems, etc. Here, I am also interested in corresponding eigenproblems and methods of their solution.

In addition, I had been working in the field of holography with application to microelectronics.

## **Main achievements**

### **Awards and Honors**

- Nauka/Interperiodica (Russian Academy of Sciences' Publisher) Award for the best article, 2012 (with Akulenko L.D., Bolotnik N.N., Borisov A.E., and Emelyanov G.A. for the paper "Control of the apparent acceleration of a rigid body attached to a movable base by means of a two-degree-of-freedom gimbal", *Journal of Computer and Systems Sciences International*, **51**(3), 339–348))
- Young Scientists Award, IPMech RAS, 1st Prize (2017), 2nd Prize (2011, 2013) for the works on spectral and dynamic characteristics of inhomogeneous materials

### **Grants (2015-2021)**

- Russian Foundation for Basic Research (RFBR) 16-31-60078-mol\_dk, "Eigenoscillations of distributed mechanical systems with nonlinear dependence on the spectral parameter" 2016-2018, **PI** (solo)  
*Developing numerical methods for solution of generalized Sturm-Liouville problems with application to elastic structures*
- National Scientific Foundation (NSF), PHY-2140010, "EAGER:Large-Scale Behavior and Collective Effects in Concentrated Bacterial Suspensions in Mucus" 2021-2022 (supported my postdoc position), **PI** – Prof. I. Aronson, **Co-Pi** – Prof. L. Berlyand (Penn State)  
*Modeling bacteria swimming in biofluids*
- NSF, PHY-1707900, "Control of Flagellated Bacteria Motion in Anisotropic Fluids" 2020-2022 (supported my postdoc position), **PI** – Prof. L. Berlyand, **Co-Pi** – Prof. I. Aronson (Penn State)  
*Modeling bacteria swimming in biofluids*
- Russian Science Foundation (RSF), 14-50-00005, "Modern mathematics and its applications" 2016 (participant), **PI** – Acad. Dmitrii Treschev (Steklov Mathematical Institute)  
*Modeling conditions of explosion for materials under plastic deformations; modeling layered creep materials*
- RSF, 16-11-10343, "Problems of control and optimization of complex mechanical systems and structures" 2016-2020 (participant), **PI** – Dr. Leonid Akulenko (IPMech RAS)  
*Developing control algorithms for elastic rod-like structures*
- RFBR, 19-01-00173 A, "Mathematical modeling and design of strategies for 3D solid-body printing of optimal structure" 2018-2020 (participant), **PI** – Dr. Georgy Kostin (IPMech RAS)  
*Developing control algorithms for elastic rod-like structures and heat conducting systems*
- RFBR 18-01-00812 A, "Variational and projection methods for reduction of mathematical models and control optimization in dynamical systems with distributed parameters" 2018-2020 (participant), **PI** – Dr. Vasilii Saurin (IPMech RAS)  
*Developing control algorithms for elastic rod-like structures and heat conducting systems*
- Alexander von Humboldt Foundation (Germany) "Advanced Finite Element Techniques in Reliable Modelling, Control Design, and Experimental Validation of Heat Transfer Processes" Research Group Linkage Project 2016-2019 (participant), **PI** – Prof. Dr.-Ing. Harald Aschemann (Rostock University)  
*Developing control algorithms for heat conducting systems by means of thermoelectric converters*
- RFBR 17-01-00538 A, "Dynamics and motion control of systems with internal degrees of freedom in conditions close to weightlessness" 2017-2019 (participant), **PI** – Corr. Member of RAS Nikolai Bolotnik (IPMech RAS)  
*Developing control algorithms for a vibration protection platform working in zero gravity conditions*

- RFBR 16-01-00412 A, "Problems of dynamics and control of systems with integral aftereffect" 2016-2018 (participant), PI – Dr. Alexey Shamaev (IPMech RAS, MSU)  
*Developing homogenized models for materials with alternating characteristics and studying their spectrum of oscillations*
- RFBR 15-01-00827 A, "Integro-differential approaches to modeling, analysis and optimization of dynamics of mechanical systems with distributed parameters" 2015-2017 (participant), PI – Dr. Vasilii Saurin (IPMech RAS)  
*Modeling layered creep materials and studying oscillations of elastic systems*
- RFBR 14-01-00356 A, "Control of mechanical systems and processes in conditions close to weightlessness" 2014-2016 (participant), PI – Dr. Leonid Akulenko (IPMech RAS)  
*Developing control algorithms for a vibration protection platform working in zero gravity conditions*
- RFBR 14-01-00282 A, "Experimental and theoretical studies of the influence of defects on the oscillation spectra of mechanical systems" 2014-2016 (participant)  
*Studying spectrum of oscillations of inhomogeneous materials*
- RFBR 13-01-00384 A, "Development of effective models of heterogeneous media with integral delay and analysis of some control problems for them" 2013-2015 (participant)  
*Studying spectrum of oscillations of inhomogeneous materials*

#### **Research Contracts b/w IPMech RAS & TsNIIMash (Central Research Institute of Machine Building)**

- Development of mathematical models and algorithms for the functioning of systems for optimizing dynamic conditions for conducting microgravity studies on board of an automatic spacecraft for technological purposes, 2018, PI – Corr. Member of RAS Nikolai Bolotnik (IPMech RAS), Co-PI – Dr. Andrei Borisov (TsNIIMash)
- Development of formalized criteria for the operation of an on-board rotating platform for solving problems of microgravity research, 2013, PI – Dr. Leonid Akulenko (IPMech RAS), Co-PI – Dr. Andrei Borisov (TsNIIMash)
- Modeling of the operation of a two-stage electric drive with torsion isolator under various modes of operation of the automatic rotating vibration protection platform, 2013, PI – Dr. Leonid Akulenko (IPMech RAS) Co-PI – Dr. Andrei Borisov (TsNIIMash)
- Development of software for the experimental equipment for complex tests and maintenance of space experiments, 2012, PI – Dr. Leonid Akulenko (IPMech RAS)
- Development of software and methodological guidelines for the space experiment „TriboSpace“, 2011, PI – Dr. Marat Bronovets (IPMech RAS)

#### **Research Contracts**

- UralChem: Modeling layered creep materials with application to salt mining
- UralChem: Modeling conditions of explosion for materials under plastic deformations

#### **Professional Advancement**

- A member of the Talent pool of the Federal Agency of Scientific Organizations (now - Ministry of Science and Higher Education, Russia) for vice-directors of scientific organizations, June 2017
- The IBM IP management commercialization and research management workshop, May 2017

#### **Academic Service**

- Chair of local organizing committee, workshop “Living Active Matter: Theory and Experiment” PSU, State College, USA, May 15-17, 2022
- Member of local organizing committee, 14th International Workshop on Dynamics and Control, Zvenigorod, Moscow, Russia, May 28-June 2, 2007
- Regularly reviewing papers submitted to conferences organized by IFAC and IEEE
- Opponent for the doctoral dissertation of Goncharov D.A., Jan 2017, IPMech RAS, Moscow
- Reviewing M.Sc. theses at the Lomonosov Moscow State University and Moscow Institute of Physics and Technology
- Reviewing for Numerical Functional Analysis and Optimization, Journal of Applied Mathematics and Mechanics, International Journal of Computer Mathematics, Differential Equations, Izvestiya: Mathematics

#### **Training Experience**

Oversaw M.Sc. student theses at the Lomonosov Moscow State University (advisor – A. Shamaev); a Ph.D. student, an undergraduate student thesis, and summer research of undergraduate students at the Pennsylvania State University (advisor – L.Berlyand),

**A) Submitted/In print**

1. Kostin G., Gavrikov A. (2022) Optimal motions of an elastic structure under finite-dimensional distributed control. Submitted to *SIAM Journal on Control and Optimization*, preprint: [arXiv:2304.05765](https://arxiv.org/abs/2304.05765)
2. Kostin G., Gavrikov A. (2023, in print) Energy-Optimal Control by Boundary Forces for Longitudinal Vibrations of an Elastic Rod. *Lecture Notes in Mechanical Engineering Advanced Problems in Mechanics III*, Springer. DOI: [10.1007/978-3-031-37246-9\\_21](https://doi.org/10.1007/978-3-031-37246-9_21)
3. Gavrikov A., Kostin G. (2023, in print) Feedforward Optimal Control with Constraints for a Cylindrical Thermoelectric System Actuated by a Peltier Element. *Lecture Notes in Mechanical Engineering Advanced Problems in Mechanics III*, Springer. DOI: [10.1007/978-3-031-37246-9\\_8](https://doi.org/10.1007/978-3-031-37246-9_8)
4. Kostin G., Gavrikov A. (2023) Modeling and Optimal Control of Longitudinal Motions for an Elastic Rod with Distributed Forces. Accepted to *Proceedings of the 50th International Summer School-Conference “Advanced problems of mechanics”*, Springer, preprint: [arXiv:2206.06139](https://arxiv.org/abs/2206.06139)
5. Gavrikov A., Kostin G. (2023) Time Optimization of Constrained Control for a Thermoelectric Solid System with a Peltier Element. Accepted to *Proceedings of the 50th International Summer School-Conference “Advanced problems of mechanics”*, Springer, preprint: [arXiv:2206.06745](https://arxiv.org/abs/2206.06745)

**B) Refereed Journals and Conference Proceedings, by research areas**

***Mechanics of inhomogeneous media***

6. Chi H., Gavrikov A., Berlyand L., Aranson I.S. (2022) Interaction of microswimmers in viscoelastic liquid crystals. *Communications Physics*, **5**, 274, 1–11. DOI: [10.1038/s42005-022-01056-1](https://doi.org/10.1038/s42005-022-01056-1)
7. Gavrikov A.A., Shamaev A.S. (2018) On the modeling of creep layered structures with nonlinear constitutive relations. *IFAC-PapersOnline*, **51**(2), 150–155. DOI: [10.1016/j.ifacol.2018.03.026](https://doi.org/10.1016/j.ifacol.2018.03.026)
8. Gavrikov A.A., Knyazkov D.Yu., Melnikov A.M., Shamaev A.S., Vedenev V.V. (2018) On limits of applicability of the homogenization method to modeling of layered creep media. *IFAC-PapersOnline*, **51**(2), 144–149. DOI: [10.1016/j.ifacol.2018.03.025](https://doi.org/10.1016/j.ifacol.2018.03.025)
9. Akulenko L.D., Gavrikov A.A., Nesterov S.V. (2013) Resonance method used to determine dynamic properties of liquid-saturated granular media. *Mechanics of Solids*, **48**(5), 561–572. DOI: [10.3103/S0025654413050129](https://doi.org/10.3103/S0025654413050129)
10. Gavrikov A.A. (2013) Small oscillations of an emulsion of two weakly viscous compressible liquids. *Journal of Applied Mathematics and Mechanics*, **77**(5), 519–531. DOI: [10.1016/j.jappmathmech.2013.12.007](https://doi.org/10.1016/j.jappmathmech.2013.12.007)
11. Gavrikov A.A., Shamaev A.S. (2011) Some problems in acoustics of emulsions. *Journal of Mathematical Sciences*, **179**(3), 415–436. DOI: [10.1007/s10958-011-0601-6](https://doi.org/10.1007/s10958-011-0601-6)
12. Nesterov S.V., Akulenko L.D., Gavrikov A.A. (2011) Determination of dynamic density of a granulated medium impregnated with a liquid. *Doklady Physics*, **56**(2), 126–129. DOI: [10.1134/S1028335811020145](https://doi.org/10.1134/S1028335811020145)
13. Gavrikov A.A. Shamaev A.S. (2010) On some problems in acoustics of emulsions. *Doklady Physics*, **55**(9), 450–454. DOI: [10.1134/S1028335810090077](https://doi.org/10.1134/S1028335810090077)
14. Vlasov V.V., Gavrikov A.A., Ivanov S.A., Knyazkov D.Y., Samarin V.A., Shamaev A.S. (2010) Spectral properties of combined media. *Journal of Mathematical Sciences*, **164**(6), 948–963. DOI: [10.1007/s10958-010-9776-5](https://doi.org/10.1007/s10958-010-9776-5)

***Control problems in heat transfer***

15. Gavrikov A., Kostin G., Aschemann H., Rauh A. (2020) Modeling and control of a thermoelectric structure with a Peltier element subject to external disturbances. *IFAC-PapersOnLine*, **53**(2), 7771–7776. DOI: [10.1016/j.ifacol.2020.12.1542](https://doi.org/10.1016/j.ifacol.2020.12.1542)
16. Gavrikov A., Kostin G. (2020) A nonlinear model of heat transfer for cylindrical bodies controlled by a thermoelectric converter. *15th International Conference Stability and Oscillations of Nonlinear Control Systems (Pyatnitskiy's Conference), STAB 2020*. IEEE Conference Publications, 19772889. DOI: [10.1109/STAB49150.2020.9140683](https://doi.org/10.1109/STAB49150.2020.9140683)
17. Kostin G., Rauh A., Gavrikov A., Knyazkov D., Aschemann H. (2019) Heat transfer in cylindrical bodies controlled by a thermoelectric converter. *IFAC-PapersOnLine*, **52**(15), 139–144. DOI: [10.1016/j.ifacol.2019.11.664](https://doi.org/10.1016/j.ifacol.2019.11.664)

18. Knyazkov D., Kostin G., Gavrikov A., Aschemann H., Rauh A., (2019) FEM modeling and parameter identification of thermoelectrical processes in cylindrical bodies. *24th International Conference on Methods & Models in Automation & Robotics (MMAR)*. IEEE Conference Publications, 19127399. DOI: [10.1109/MMAR.2019.8864704](https://doi.org/10.1109/MMAR.2019.8864704)
19. Gavrikov A., Kostin G., Knyazkov D., Rauh A., Aschemann H. (2019) Experimental validation of a nonlinear model for controlled thermoelectric processes in cylindrical bodies. *24th International Conference on Methods & Models in Automation & Robotics (MMAR)*. IEEE Conference Publications, 19127400. DOI: [10.1109/MMAR.2019.8864613](https://doi.org/10.1109/MMAR.2019.8864613)
20. Gavrikov A., Kostin G., Knyazkov D., Rauh A., Aschemann H. (2019) Parameter optimization of control with feedback linearization for a model of thermoelectric processes in cylindrical bodies. *24th International Conference on Methods & Models in Automation & Robotics (MMAR)*. IEEE Conference Publications, 19048110. DOI: [10.1109/MMAR.2019.8864725](https://doi.org/10.1109/MMAR.2019.8864725)
21. Gavrikov A., Kostin G. (2018) An integro-differential approach to LQ-optimal control problems for heat transfer in a cylindrical body. *23rd International Conference on Methods & Models in Automation & Robotics (MMAR)*. IEEE Conference Publications, 71–76. DOI: [10.1109/mmar.2018.8486076](https://doi.org/10.1109/mmar.2018.8486076)
22. Knyazkov D., Aschemann H., Kersten J., Kostin G., Rauh A., Gavrikov A. (2018) Modeling of heat transfer in controlled processes for cylindrical bodies. *MATHMOD 2018 Extended Abstract Volume, ARGESIM Report*, **55**, 7–8. DOI: [10.11128/arep.55.a55126](https://doi.org/10.11128/arep.55.a55126)
23. Gavrikov A., Kostin G. (2017) Boundary control of heat transfer processes in a cylindrical body. *22nd International Conference on Methods and Models in Automation and Robotics (MMAR)*. IEEE Conference Publications, 192–196. DOI: [10.1109/mmar.2017.8046822](https://doi.org/10.1109/mmar.2017.8046822)

### **Control of vibrations**

24. Kostin G., Gavrikov A. (2022) Controllability and optimal control design for an elastic rod actuated by piezoelements. *IFAC-PapersOnLine*, **55**(16), 350–355. DOI: [10.1016/j.ifacol.2022.09.049](https://doi.org/10.1016/j.ifacol.2022.09.049)
25. Gavrikov A., Kostin G. (2023) Optimal LQR Control for longitudinal vibrations of an elastic rod actuated by distributed and boundary forces. *Recent Trends in Wave Mechanics and Vibrations. WMVC 2022. Mechanisms and Machine Science*, vol. 125. Springer, 285–295. DOI: [10.1007/978-3-031-15758-5\\_28](https://doi.org/10.1007/978-3-031-15758-5_28)
26. Kostin G., Gavrikov A. (2022) Optimal motion of an elastic rod controlled by piezoelectric actuators and boundary forces. *2022 16th International Conference on Stability and Oscillations of Nonlinear Control Systems (Pyatnitskiy's Conference)*, IEEE, pp. 1-4, DOI: [10.1109/STAB54858.2022.9807484](https://doi.org/10.1109/STAB54858.2022.9807484)
27. Gavrikov A.A., Kostin G.V. (2021) Optimal Control of Longitudinal Motion of an Elastic Rod Using Boundary Forces. *Journal of Computer and Systems Sciences International*, **60**(5), 740–755. DOI: [10.1134/S1064230721050099](https://doi.org/10.1134/S1064230721050099)
28. Akulenko L.D., Bolotnik N.N., Borisov A.E., Gavrikov A.A., Emelyanov G.A. (2019) Orientation control of an object on a rotating base by using a two-stage electric drive. *Journal of Computer and Systems Sciences International*, **58**(6), 829–843. DOI: [10.1134/S1064230719060029](https://doi.org/10.1134/S1064230719060029)
29. Gavrikov A., Akulenko L. (2018) A quasi-stationary approach to control problems for hybrid flexible systems. *23rd International Conference on Methods & Models in Automation & Robotics (MMAR)*. IEEE Conference Publications, 298–303. DOI: [10.1109/mmar.2018.8486110](https://doi.org/10.1109/mmar.2018.8486110)
30. Akulenko L.D., Gavrikov A.A. (2018) Controlling the one-dimensional motion of hybrid vibrational rod systems. *Journal of Computer and Systems Sciences International*, **57**(3), 349–357. DOI: [10.1134/s1064230718020028](https://doi.org/10.1134/s1064230718020028)
31. Akulenko L.D., Bolotnik N.N., Borisov A.E., Gavrikov A.A., Emelyanov G.A. (2015) Quasi-optimal control of rotation of a rigid body about a fixed axis taking friction into account. *Journal of Computer and Systems Sciences International*, **54**(3), 331–348. DOI: [10.1134/S1064230715030028](https://doi.org/10.1134/S1064230715030028)
32. Akulenko L.D., Bolotnik N.N., Borisov A.E., Gavrikov A.A., Emelyanov G.A. (2012) Control of the apparent acceleration of a rigid body attached to a movable base by means of a two-degree-of-freedom gimbal. *Journal of Computer and Systems Sciences International*, **51**(3), 339–348. DOI: [10.1134/S1064230712020025](https://doi.org/10.1134/S1064230712020025)
33. Akulenko L., Gavrikov A. (2018) Motion control of a nonhomogeneous rod with a boundary load. *14th International Conference Stability and Oscillations of Nonlinear Control Systems (Pyatnitskiy's Conference), STAB 2018*. IEEE Conference Publications, 1–3. DOI: [10.1109/stab.2018.8408335](https://doi.org/10.1109/stab.2018.8408335)

34. Gavrikov A. (2017) An iterative solution approach to eigenvalue problems for linear Hamiltonian systems and its application to a hybrid system control problem. *22nd International Conference on Methods and Models in Automation and Robotics (MMAR)*. IEEE Conference Publications, 588–593. DOI: [10.1109/mmar.2017.8046894](https://doi.org/10.1109/mmar.2017.8046894)

#### **Vibration theory**

35. Gavrikov A. (2019) The numerical method for solution of eigenproblems for linear Hamiltonian systems and its application to the eigenproblem for a rotating wedge beam with a crack. *AIP Conference Proceedings*, **2116**, 450074. DOI: [10.1063/1.5114541](https://doi.org/10.1063/1.5114541)
36. Akulenko L.D., Gavrikov A.A., Nesterov S.V. (2019) Identification of cross-section defects of the rod by using eigenfrequencies and features of the shape of longitudinal oscillations. *Mechanics of Solids*, **54**(8), 1208-1215. DOI: [10.3103/S0025654419080119](https://doi.org/10.3103/S0025654419080119)
37. Akulenko L.D., Gavrikov A.A., Nesterov S.V. (2018) Natural transverse oscillations of a rotating rod of variable cross section. *Mechanics of Solids*, **53**(5), 510-519. DOI: [10.3103/S0025654418080058](https://doi.org/10.3103/S0025654418080058)
38. Gavrikov A.A. (2018) Solution of eigenvalue problems for linear Hamiltonian systems with a nonlinear dependence on the spectral parameter. *Mechanics of Solids / Journal of Applied Mathematics and Mechanics*, **53**(Suppl. 2), S118–S132. DOI: [10.3103/S0025654418050059](https://doi.org/10.3103/S0025654418050059)
39. Akulenko L.D., Gavrikov A.A., Nesterov S.V. (2018) Natural vibrations of a liquid-transporting pipeline on an elastic base. *Mechanics of Solids*, **53**(1), 101–110. DOI: [10.3103/s0025654418010120](https://doi.org/10.3103/s0025654418010120)
40. Gavrikov A.A. (2017) Numerical solution of eigenproblems for linear Hamiltonian systems and their application to non-uniform rod-like systems. *2017 Days on Diffraction (DD)*. IEEE Conference Publications, 122–127. DOI: [10.1109/dd.2017.8168009](https://doi.org/10.1109/dd.2017.8168009)
41. Gavrikov A. (2017) Numerical solution of vector Sturm-Liouville problems with a nonlinear dependence on the spectral parameter. *AIP Conference Proceedings*, **1863**, 560032. DOI: [10.1063/1.4992715](https://doi.org/10.1063/1.4992715)
42. Akulenko L.D., Gavrikov A.A., Nesterov S.V. (2017) Numerical solution of vector Sturm–Liouville problems with dirichlet conditions and nonlinear dependence on the spectral parameter. *Computational Mathematics and Mathematical Physics*, **57**(9), 1484–1497. DOI: [10.1134/S0965542517090020](https://doi.org/10.1134/S0965542517090020)
43. Akulenko L.D., Gavrikov A.A., Nesterov S.V. (2017) The synthesis of an inhomogeneous elastic system with a boundary load. *Moscow University Mechanics Bulletin*, **72**(5), 113–118. DOI: [10.3103/s002713301705003x](https://doi.org/10.3103/s002713301705003x)
44. Akulenko L.D., Gavrikov A.A., Nesterov S.V. (2017) Natural Oscillations of Multidimensional Systems Nonlinear in Spectral Parameters. *Doklady Physics*, **62**(2), 90-94. DOI: [10.1134/S1028335817020094](https://doi.org/10.1134/S1028335817020094)

#### **Diffraction problems:**

45. Borisov M.V., Chelyubeev D.A., Chernik V.V., Gavrikov A.A., Knyazkov D.Y., Mikheev P.A., Rakhovsky V.I., Shamaev A.A. (2012) Phase-shift at subwavelength holographic lithography (SWHL). In Behringer U.F.W., Maurer W. (Eds.) *28th European Mask and Lithography Conference*. Proceedings of SPIE, **8352**, 83520. DOI: [10.1117/12.918016](https://doi.org/10.1117/12.918016)
46. Borisov, M.V., Chelyubeev, D.A., Chernik, V.V., Gavrikov, A.A., Knyazkov, D.Yu., Mikheev, P.A., Rakhovskiy, V.I., Shamaev, A.S. (2012) Analysis of an effect of perturbations in SWHM and illuminating optical scheme parameters on an aerial image. In *Proc. of Advanced Semiconductor Manufacturing Conference 2012*. IEEE Conference Publications, 165–169. DOI: [10.1109/ASMC.2012.6212903](https://doi.org/10.1109/ASMC.2012.6212903)
47. Borisov M.V., Borovikov V. A., Gavrikov A.A., Knyazkov D.Yu., Rakhovskii V.I., Chelyubeev D.A., Shamaev A.S. (2010) Methods of the development and correction of the quality of holographic images of geometry objects with subwave-size elements. *Doklady Physics*, **55**(9), 436–440. DOI: [10.1134/S102833581009003X](https://doi.org/10.1134/S102833581009003X)

#### **Patents**

48. US Patent 9,310,768. Method for synthesis and formation of a digital hologram for use in microlithography. Rakhovsky V., Borisov M., Shamaev A., Chelyubeev D., Gavrikov A., Chernik V., Mikheev P. Applicant and assignee: Rakhovsky V. April 12, 2016. Application [20150185695 A1](https://patents.google.com/patent/20150185695). Filed: December 28, 2013, Publication: Jul 2, 2015.
49. US Patent 9,557,711. Method of static scaling of image in holographic lithography. Rakhovsky V., Borisov M., Shamaev A., Chelyubeev D., Gavrikov A., Chernik V., Mikheev P. Applicant and assignee: Rakhovsky V. January 31, 2017 Application [20150185697 A1](https://patents.google.com/patent/20150185697). Filed: May 1, 2014, Publication: Jul 2, 2015.



50. RU Patent 2396584. A method of constructing holographic images of a pattern [Text]/ Borisov, M.V., Gavrikov, A.A., Knyazkov, D.Y., Rakhovskii, V.I., Chelyubeev, D.A., Shamaev, A.S. owner Rakhovskii, V.I. - № 2009128066/28; appl. 22.07.2009; publ. 10.08.2010. - 14 p.: fig. 27.
51. RU Patent 2486561. A method of constructing holographic images of a pattern [Text] / Borisov, M.V., Chelyubeev, D.A., Chernik, V.V., Gavrikov, A.A., Knyazkov, D.Yu., Mikheev, P.A., Rakhovskiy, V.I., Shamaev, A.S. owner Rakhovskii, V.I. - № 2011152059/28; appl. 21.12.2011; publ. 27.06.2013, Bull. № 18. - 14 p.: fig.
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### Presentations at conferences and seminar talks

- Workshop “Frontiers in Active Matter” PSU, State College, USA, June 12-15, 2023 — **Gavrikov A.**, Berlyand L., Aronson I., *Modeling large-scale bacterial motion in mucus*
- IPMech RAS, Control theory and system dynamics seminar, Moscow, Russia, Jan 26, 2023 — Gavrikov A., **Kostin G.**, *Optimal movement of an elastic rod controlled by piezoelectric actuators*
- 18th IFAC Workshop on Control Applications of Optimization (CAO), Gif sur Yvette, France, July 18-22 2022 — **Kostin G.**, Gavrikov A., *Controllability and Optimal Control Design for an Elastic Rod Actuated by Piezoelements*
- 10th Int. Conf. on Wave Mechanics and Vibrations (WMVC), Lisbon, Portugal, July 4-6 2022 — **Gavrikov A.**, Kostin G., *Optimal LQR control for longitudinal vibrations of an elastic rod actuated by distributed and boundary forces*
- 50th Int. Summer School-Conf. “Advanced Problems in Mechanics” St. Petersburg, Russia, June 20-24, 2022 — **Gavrikov A.**, Kostin G., *Time Optimization of Constrained Control for a Thermoelectric Solid System with a Peltier Element*; **Kostin G.V.**, Gavrikov A.A., *Optimal Control of Longitudinal Motions for an Elastic Rod with Distributed Forces*
- XVI Int. Conf. "Stability and Oscillations of Nonlinear Control Systems" (Pyatnitskiy's Conference) ICS RAS, Moscow, Russia, June 1 - 3, 2022 — **Kostin G.V.**, Gavrikov A.A., *Optimal Motion of an Elastic Rod Controlled by Piezoelectric Actuators and Boundary Forces*
- Workshop “Living Active Matter: Theory and Experiment” PSU, State College, USA, May 15-17, 2022 — Chi H., **Gavrikov A.**, Berlyand L., Aronson I., *Interaction of microswimmers in viscoelastic liquid crystals*
- 64th Moscow Institute of Physics and Technology Sc. Conf., Dolgoprudny, Russia, Nov 23 - Dec 3, 2021 — **Kostin G.V.**, Gavrikov A.A., *Optimal Control of Longitudinal Motions of an Elastic Rod with Piezoelectric Actuators*
- University of California, Riverside, Department of Mathematics, PDE & Applied math seminar, USA, Nov 1, 2021 — Chi H., **Gavrikov A.**, Berlyand L., Aronson I., *Modeling the bacterial motion in viscoelastic liquid crystals*
- XLIX Int. Summer School-Conf. “Advanced Problems in Mechanics” St. Petersburg, Russia, June 21-25, 2021 — **Kostin G.V.**, Gavrikov A.A., *Energy-Optimal Control by Boundary Forces for Longitudinal Vibrations of an Elastic Rod*; **Gavrikov A.**, Kostin G., *Feedforward Optimal Control with Constraints for a Cylindrical Thermoelectric System Actuated by a Peltier Element*
- IPMech RAS, Control theory and system dynamics seminar, Moscow, Russia, Apr 8, 2021 — Gavrikov A., **Kostin G.**, *Control of nonlinear heat transfer processes in a system of solid bodies by means of a thermoelectric Peltier element*
- 63rd Moscow Institute of Physics and Technology Sc. Conf., Dolgoprudny, Russia, Nov 23-29, 2020 — **Gavrikov A.**, Kostin G., *Control of longitudinal vibrations of a rod by means of distributed piecewise constant and boundary controls*
- IFAC World Congress 2020, Berlin, Germany, July 13-17, 2020 — **Gavrikov A.**, Kostin G., Aschemann H., Rauh A., *Modeling and control of a thermoelectric structure with a Peltier element subject to external disturbances*
- XV Int. Conf. «Stability and Oscillations of Nonlinear Control Systems» (Pyatnitskiy conf.) STAB 2020, Moscow, Russia, June 3-5, 2020 — Gavrikov A., **Kostin G.**, *Nonlinear model of controlled heat transfer between a thermoelectric converter and cylindrical bodies*
- 62nd Moscow Institute of Physics and Technology Sc. Conf., Dolgoprudny, Russia, Nov 18-23, 2019 — **Gavrikov A.**, *Parametric optimization of control of thermoelectric processes in cylindrical bodies with feedback linearization;*

**Gavrikov A.**, Kostin G., *Experimental validation of a nonlinear model of controlled thermoelectric processes in cylindrical bodies*

- Lomonosov Moscow State University, Faculty of Mechanics and Mathematics, Partial differential equations seminar, Moscow, Russia, Nov 11 2019 — **Gavrikov A.**, *On some models of complex media arising in math biology*
- Joint Conf. 8th IFAC Symposium on Mechatronic Systems (MECHATRONICS 2019), and 11th IFAC Symposium on Nonlinear Control Systems (NOLCOS 2019), Vienna, Austria, Sep 4-6, 2019 — **Kostin G.**, Rauh A., Gavrikov A., Knyazkov D., Aschemann H., *Heat Transfer in Cylindrical Bodies Controlled by a Thermoelectric Converter*; Gavrikov A., **Kostin G.**, Aschemann H., Rauh A., *A Nonlinear Model of Heat Transfer in Cylinders Actuated by a Peltier Element*
- 24th Int. Conf. on Methods & Models in Automation & Robotics (MMAR 2019), Międzyzdroje, Poland, Aug 26-29, 2019 — **Gavrikov A.**, Kostin G., Knyazkov D., Rauh A., Aschemann H., *Experimental validation of a nonlinear model for controlled thermoelectric processes in cylindrical bodies*; **Knyazkov D.**, Kostin G., Gavrikov A., Aschemann H., Rauh A., *FEM modeling and parameter identification of thermoelectrical processes in cylindrical bodies*; **Gavrikov A.**, Kostin G., Knyazkov D., Rauh A., Aschemann H., *Parameter optimization of control with feedback linearization for a model of thermoelectric processes in cylindrical bodies*
- Int. Sc. Conf. “Modern Problems of Mathematics and Mechanics”, dedicated to the 80th anniversary of Academician V. A. Sadovnichy’s Birth, Moscow, Russia, May 13-15, 2019 — **Gavrikov A.**, *On the solution of eigenproblems for linear Hamiltonian systems*
- Lomonosov Moscow State University, Faculty of Mechanics and Mathematics, Partial differential equations seminar, Moscow, Russia, Mar 11 2019 — **Gavrikov A.**, *On solution of eigenproblems for rod-like systems*
- 23rd Int. Conf. on Methods & Models in Automation & Robotics (MMAR 2018), Międzyzdroje, Poland, Aug 27-30, 2018 — Kostin G., **Gavrikov A.**, *An Integro-Differential Approach to LQ-Optimal Control Problems for Heat Transfer in a Cylindrical Body*; Akulenko L., **Gavrikov A.**, *A Quasi-Stationary Approach to Control Problems for Hybrid Flexible Systems*
- 61st Moscow Institute of Physics and Technology Sc. Conf., Dolgoprudny, Russia, 19-25 Nov 2018 — **Kostin G.V.**, Gavrikov A.A., Knyazkov D.Yu., *Modeling the heat transfer between a thermoelectric converter and cylindrical bodies*; **Gavrikov A.A.**, Kostin G.V., *Application of the method of integro-differential relations to the heat transfer control problem in a cylindrical body*; **Gavrikov A.A.**, *Natural vibrations of a rotating wedge-shaped rod*
- Workshop dedicated to the 110th anniversary of S.A. Khristianovich’s Birth “Modern problems of mechanics and mathematics”, Moscow, Russia, Nov 15-16, 2018 — Akulenko L.D., Gavrikov A.A., **Nesterov S.V.**, *Natural vibrations of a pipeline lying on an elastic foundation*; Akulenko L.D., **Gavrikov A.A.**, **Nesterov S.V.**, *Natural vibrations of a rotating rod of variable cross-section*
- TsNIIMash Scientific Council, Korolyov, Russia, Nov 5, 2018 — Akulenko L.D., Ananievsky I.M., Baydulov V.G., **Bolotnik N.N.**, Gavrikov A.A., *Development of mathematical models and algorithms for the functioning of systems for optimizing dynamic conditions for conducting microgravity studies on board of an automatic spacecraft for technological purposes*
- 4th Int. Sc. School for Young Scientists “Physical and Mathematical Modeling of Processes in Geomedial”, Moscow, IPMech RAS, Russia, Oct 24-26, 2018 — Akulenko LD, **Gavrikov A.A.**, **Nesterov S.V.**, *Natural vibrations of a pipeline with nonhomogenous properties*; **Nesterov S.V.**, Baydulov V.G., Gavrikov A.A., *Comparison of mechanical properties of bottom soils of the Black and Barents Seas*
- 16th Int. Conf. on Numerical Analysis and Applied Mathematics (ICNAAM 2018), Rhodes, Greece, Sept 13-18, 2018 — **Gavrikov A.**, *The Numerical Method for Solution of Eigenproblems for Linear Hamiltonian Systems and Its Application to the Eigenproblem for a Rotating Wedge Beam with a Crack*
- Int. Conf. Days on Diffraction 2018, St. Petersburg, Russia, June 4 – 8, 2018 — **Gavrikov A.**, *Natural vibrations of some inhomogeneous rod-like systems*
- XIV Int. Conf. “Stability and Oscillations of Nonlinear Control Systems” (Pyatnitsky Conference) STAB-2018, Moscow, Russia, May 30 – June 1, 2018 — Akulenko L. D., **Gavrikov A. A.**, *Motion control non-uniform rod with boundary load*
- 9th Vienna Int. Conf. on Mathematical Modeling MATHMOD 2018, Vienna, Austria, Feb 21-23, 2018 — **Knyazkov D.**, Aschemann H., Kersten J., Kostin G., Rauh A., Gavrikov A., *Modeling of Heat Transfer in Controlled Processes for Cylindrical Bodies*; **Gavrikov A.**, Shamaev A. *On the Modeling of Creep Layered Structures with Nonlinear Constitutive Relations*; Gavrikov A., **Knyazkov D.**, Melnikov A., Shamaev A., Vedenev V., *On Limits of Applicability of the Homogenization Method to Modeling of Layered Creep Media*



- IPMech RAS Scientific Council, Moscow, Russia, Dec 21 2017 — **Gavrikov A.**, *Eigenoscillations of distributed mechanical systems with nonlinear dependence on the spectral parameter*”
- 60th Moscow Institute of Physics and Technology Sc. Conf., Dolgoprudny, Russia, Nov 20-26, 2017 — **Gavrikov A.A.**, Kostin G.V. *Control of heat transfer processes in a cylindrical body*; Akulenko L.D., **Gavrikov A.A.**, *On the motion control of a one-dimensional rod system with a boundary load*; **Gavrikov A.A.**, *On the solution of eigenvalue problems for linear Hamiltonian systems*
- Int. Sc. Conf. “Fundamental and Applied Problems of Mechanics (FAPM-2017)” dedicated to the 170th anniversary of N.Y. Zhukovsky’s birth, Oct 24-27, 2017, Moscow, Russia — Gavrikov A.A., **Nesterov S.V.**, *An effective numerical-analytical method with quadratic convergence for solving a generalized boundary value problem of Sturm–Liouville type*; **Gavrikov A.A.**, *Motion control of a hybrid oscillatory system*; Akulenko L.D., **Gavrikov A.A.**, **Nesterov S.V.** *Accelerated convergence method for solving vector generalized eigenproblems*
- Conf. of Young Scientists in Mechanics, Sochi, Russia, Sept 5-15, 2017 — Akulenko L.D., **Gavrikov A.A.**, *On a control problem for a hybrid system*; **Gavrikov A.A.**, *On the solution of eigenproblems for linear Hamiltonian systems*
- 22nd Int. Conf. on Methods & Models in Automation & Robotics (MMAR 2017), Międzyzdroje, Poland, Aug 28-31, 2017 — **Gavrikov A.**, *An Iterative Solution Approach to Eigenvalue Problems for Linear Hamiltonian Systems and its Application to a Hybrid System Control Problem*; **Gavrikov A.**, Kostin G. *Boundary Control of Heat Transfer Processes in a Cylindrical Body*
- Rostock University, Chair of Mechatronics, Germany, Aug 24, 2017 — **Gavrikov A.**, Kostin G., *Controlled heat transfer in a cylindrical body surrounded by ambient air*
- Int. Conf. Days on Diffraction 2017, St. Petersburg, Russia, June 19 – 23, 2017 — **Gavrikov A.**, *Numerical solution of eigenproblems for linear Hamiltonian systems and their application to non-uniform rod-like systems*
- UiT The Arctic University of Norway, Narvik, Norway, Apr 2017 — Akulenko L., **Gavrikov A.**, **Nesterov S.**, *Elastic and dissipative properties of a fluid-saturated granular and porous medium*; **Gavrikov A.**, *Numerical solution of eigenproblems for linear Hamiltonian systems*
- Lomonosov Moscow State University, Faculty of Mechanics and Mathematics, Partial differential equations seminar, Moscow, Russia, Mar 17 2017 — **Gavrikov A.**, *Accelerated convergence method in spectral problems*
- IPMech RAS Scientific Council, Moscow, Russia, Dec 15 2016 — **Gavrikov A.**, *Eigenoscillations of distributed mechanical systems with nonlinear dependence on the spectral parameter*”
- 14th Int. Conf. on Numerical Analysis and Applied Mathematics (ICNAAM 2016), Rhodes, Greece, Sept 19-25, 2016 — **Gavrikov A.**, *Numerical Solution of Vector Sturm-Liouville Problems with a Nonlinear Dependence on the Spectral Parameter*
- 59<sup>th</sup> Moscow Institute of Physics and Technology Sc. Conf., Dolgoprudny, Russia, Nov 21-26, 2016 — **Gavrikov A.A.**, Kostin G.V. *Heat transfer processes in a cylindrical body surrounded by air*; Akulenko L.D., **Gavrikov A.A.**, *Oscillations of an inhomogeneous elastic system with a boundary load*; **Gavrikov A.A.**, *Solution of the vector boundary value problem of Sturm-Liouville type with nonlinear dependence on the spectral parameter*
- Rostock University, Chair of Mechatronics, Germany, Aug 16, 2016 — **Gavrikov A.**, Kostin G., *Heat transfer in a cylindrical body surrounded by ambient air*
- Int. Conf. «Quasilinear equations, inverse problems and their applications», Dolgoprudny, Russia, Nov 30 — Dec 2, 2015 — Gavrikov A.A., **Knyazkov D.U.**, Romanova A.V., Chernik V.V., Shamaev A.S., *Direct and inverse problems of sea surface electromagnetic tomography*.
- IPMech RAS, System mechanics seminar, Moscow, Russia, May 16, 2016 — Akulenko L.D., **Gavrikov A.A.**, **Nesterov S.V.**, *On solution of vector Sturm-Liouville problems with nonlinear dependence on spectral parameter*
- UralChem, Moscow, Russia, Mar 2016 — Gavrikov A.A., **Knyazkov D.U.**, **Shamaev A.S.**, **Shumilova V.V.**, *On a problem of stressedly-deformed simulation for stratified saliferous rocks*
- IPMech RAS, Control theory and system dynamics seminar, Moscow, Russia, Feb 2016 — Akulenko L.D., **Gavrikov A.A.**, **Nesterov S.V.**, *On solution of vector Sturm-Liouville problems with nonlinear dependence on spectral parameter*
- IPMech RAS, Radiative gas dynamics seminar, Moscow, Russia, Jan 2016 — **Nesterov S.V.**, Akulenko L.D., **Gavrikov A.A.**, *Eigenforms and frequencies of elongated aircraft*
- IPMech RAS, Problems of continuum mechanics seminar, Moscow, Russia, Jan 2016 — Akulenko L.D., **Gavrikov A.A.**, **Nesterov S.V.**, *On solution of vector Sturm-Liouville problems with nonlinear dependence on spectral parameter*

- Sc.-practical Conf. «National Supercomputer Forum» (NSKF-2015). Pereslavl-Zalessky, Russia, Nov 24-27, 2015 — **Knyazkov D.Yu.**, Shamaev A.S., Chernik V.V., Gavrikov A.A., Romanova A.V., *Modeling the influence of surface waves on the spectrum of the ocean's own radiation*
- 58th Moscow Institute of Physics and Technology Sc. Conf., Dolgoprudny, Russia, Nov 23-28, 2015 — **Gavrikov A.A.**, Shamaev A.S. *Application of the homogenization theory to modeling layered creeping media*; **Gavrikov A.A.**, *Natural longitudinal vibrations of a thin rod of variable cross-section taking into account the cross-section inertia*
- IPMech RAS, Problems of continuum mechanics seminar, Moscow, Russia, Nov 2016 — **Gavrikov A.A.**, Shamaev A.S., *Application of homogenization to layered salt rocks modeling*
- Int. Sc. School for Young Scientists “Physical and Mathematical Modeling of Processes in Geomechanics”, Moscow, IPMech RAS, Russia, Nov 11-13, 2015 — **Gavrikov A.A.**, Shamaev A.S., *Application of homogenization theory to the modeling of layered creeping rocks*
- 57th Moscow Institute of Physics and Technology Sc. Conf., Dolgoprudny, Russia, Nov 24-29, 2014 — **Gavrikov A.A.**, *Numerical solution a 2D problem of propagation of dynamic boundary disturbances in a heat-conducting elastic-visco-plastic medium*
- Int. Conf. «Modern problems of applied mathematics and informatics» (MPAMCS-2014), Dubna, Russia, Aug 25 – 29, 2014 — Gavrikov A.A., Genkin M.V., **Knyazkov D.Yu.**, Shamaev A.S. *Parallel algorithm for calculating the propagation of elastic stresses in a cylindrical region with a wedge-shaped cross-section*
- 39th Int. Conf. on Micro and Nano Engineering. London, UK, Sept 16-19, 2013 — Borisov M.V., Chelubeev D.A., Chernik V.V., Gavrikov A.A., Knyazkov D.Yu., Mikheev P.A., **Rakhovsky V.I.**, Shamaev A.S., *Sub-Wavelength Holographic Lithography application for single exposure fabrication of complex structures on nonplanar surfaces*
- 56th Moscow Institute of Physics and Technology Sc. Conf., Dolgoprudny, Russia, Nov 25-30, 2013 — **Gavrikov A.A.**, *Estimation of the influence of the moments of friction forces in the contours of an automatic rotary platform with feedback control on the integral of the position*
- IPMech RAS, Problems of continuum mechanics seminar, Moscow, Russia, Sep 2013 — Akulenko L.D., **Gavrikov A.A.**, Nesterov S.V., *Determination of dynamic density and elasticity of granular media saturated with fluid by means of volume resonator*
- Int. Conf. “Flows and structures in liquids”. St. Petersburg, Russia, June 25-28, 2013 — **Nesterov S.V.**, Akulenko L.D., Gavrikov A.A., *Determination of dynamic density of a granular medium impregnated with liquid*
- 4th Int. Sc. School for Young Scientists “Waves and Vortexes in Complex Media”, Moscow, Russia, Nov 26-29, 2013 — Akulenko L.D., **Gavrikov A.A.**, Nesterov S.V., *Determination of the speed of sound and the bulk modulus of a granular medium saturated with liquid*
- 23rd Annual SEMI Int. Sc. Conf. «Advanced Semiconductor Manufacturing Conference» (ASMC), Saratoga Springs, USA, May 15-17, 2012 — Borisov M.V., Chelubeev D.A., Chernik V.V., Gavrikov A.A., Knyazkov D.Y., Mikheev P.A., **Rakhovsky V.I.**, Shamaev A.A., *Analysis of an Effect of Perturbations in SWHM and Illuminating Optical Scheme Parameters on an Aerial Image*
- Microelectronics and photovoltaics industry forum SEMICON / SOLARCON Russia, EU-RU.NET Workshop, Moscow, Russia, May 15-16, 2012 — Borisov M.V., Chelubeev D.A., Chernik V.V., Gavrikov A.A., Knyazkov D.Y., Mikheev P.A., **Rakhovsky V.I.**, Shamaev A.A., *A Sub-Wavelength Holographic Lithography: The Possibilities And Advantages*
- Int. Conf. “European Mask and Lithography Conference” (EMLC-2012), Dresden, Germany, Jan 17-18, 2012 — **Rakhovsky V.**, Knyazkov D., Shamaev A., Chernik V., Gavrikov A., Chelubeev D., Mikheev P., Borisov M., *Phase-Shift at Sub-Wavelength Holographic Lithography (SWHL)*
- Sc. Conf. “Control in technical, ergatic, organizational and network systems” (UTEOSS-2012). Russia, St. Petersburg, Oct 9-11, 2012 — Akulenko L.D., **Bolotnik N.N.**, Borisov A.E., Gavrikov A.A., Emelyanov G.A., *Control of the lateral component of the apparent acceleration of a rigid body fixed in a two-degree suspension on a movable base*
- IPMech RAS, System mechanics seminar, Moscow, Russia, Nov 16, 2012 — **Gavrikov A.A.**, *Effective dynamic characteristics of emulsions and granular media saturated with fluid*
- 55th Moscow Institute of Physics and Technology Sc. Conf., Dolgoprudny, Russia, Nov 19-25, 2012 — **Gavrikov A.A.**, *Estimation of the influence of the moments of friction forces in the contours of an automatic rotating platform*
- 54th Moscow Institute of Physics and Technology Sc. Conf., Dolgoprudny, Russia, Nov 25-26, 2011 — **Gavrikov A.A.**, *Dynamic Darcy's law for a mixture of two weakly viscous liquids*
- IPMech RAS, Control theory and system dynamics seminar, Moscow, Russia, Jun 2012 — **Gavrikov A.**, *Dynamic characteristics of some inhomogeneous media*

- Lomonosov Moscow State University, Faculty of Mechanics and Mathematics, Asymptotic methods in mathematical physics seminar, Moscow, Russia, May 2012 — **Gavrikov A.**, *Dynamic Darcy law for a mixture of two weakly viscous fluids*
- X Congress on Fundamental Problems of Theoretical and Applied Mechanics, 2nd School of Young Scientists in Mechanics, Nizhny Novgorod, Russia, Aug 24-30, 2011 — **Gavrikov A.A.**, *Determination of the dynamic characteristics of a granular medium impregnated with liquid;*
- IPMech RAS, Control theory and system dynamics seminar, Moscow, Russia, Jun 2011 — Akulenko L.D., **Bolotnik N.N.**, Gavrikov A., *Kinematic and dynamic analysis of control regimes for a useful load in microgravitational conditions*
- IPMech RAS, Control theory and system dynamics seminar, Moscow, Russia, Dec 2010 — Nesterov S.V., Akulenko L.D., **Gavrikov A.A.**, *Determination of dynamic characteristics of granulated media saturated with fluid*
- IPMech RAS, Problems of continuum mechanics seminar, Moscow, Russia, Nov 2010 — **Gavrikov A.A.**, *Determination of the speed of sound and the bulk modulus of a granular medium saturated with fluid*
- 53rd Moscow Institute of Physics and Technology Sc. Conf., Dolgoprudny, Russia, Nov 24-29, 2010 — **Gavrikov A.A.**, *Determination of the speed of sound and the bulk modulus of a granular medium saturated with fluid*
- St. Petersburg Sc. Forum “Science and Society. Economy and Sociology of the XXI century.” V St. Petersburg meeting of the Nobel Prize laureates, St. Petersburg, Russia, Oct 18-22, 2010 — Borisov M.V., Gavrikov A.A., Knyazkov D.Yu., **Rakhovsky V.I.**, Chelyubeev D.A., Shamaev A.S., *Methods for creating and correcting the quality of holographic images of topologies with subwavelength elements*
- Int. Conf. “7th Int. Conf. on Numerical Methods and Applications”, Bulgaria, Borovets, Aug 20-24, 2010 — Gavrikov A.A., **Knyazkov D.Yu.**, Shamaev A.S., *Some Spectral Problems of Porous Media Acoustics*
- IPMech RAS, Problems of continuum mechanics seminar, Moscow, Russia, Dec 2009 — **Gavrikov A.A.**, *Spectral problems of acoustics of emulsions*
- Int. miniconf. “Qualitative theory of differential equations”, Moscow, Russia, May 3-5, 2009 — **Shamaev A.S.**, Gavrikov A.A., *Some questions of the acoustics of emulsions*
- Int. Conf. “Spectral problems and related issues”, Moscow, Russia, Nov 18-21, 2009 — Vlasov V.V., Gavrikov A.A., **Shamaev A.S.**, *Some spectral properties of media composed of materials with different rheological characteristics* (Invited talk)
- 52nd Moscow Institute of Physics and Technology Sc. Conf., Dolgoprudny, Russia, Nov 27-30, 2009 — **Gavrikov A.A.**, *On the spectrum of one acoustic equation*
- Int. Sc. Conf. “Modern Problems of Mathematics and Mechanics and Their Applications”, dedicated to the 70th anniversary of Academician V. A. Sadovnichy’s Birth, Moscow, Russia, Mar 30- April 2, 2009 — **Shamaev A.S.**, Knyazkov D.Yu., Gavrikov A.A., *Spectral problems in acoustics of strongly inhomogeneous media*
- Int. Conf. “Control of dynamic systems”, held within the framework of the multiconference “Theory and control of systems”, Moscow, Russia, Jan 26-30, 2009 — Shamaev A.S., Knyazkov D.Yu., **Gavrikov A.A.**, *Some spectral properties of media composed of materials with different rheological characteristics*
- Int. Conf. “The 5th International Conference on Differential and Functional Differential Equations” (Moscow, RUDN), Aug 17-24, 2008 — **Shamaev A.S.**, Knyazkov D.Yu., Gavrikov A.A., *On some spectral properties of media, consisting of materials with different rheologies*