

## BIOGRAPHICAL DATA OF SERGEY G. ABAIMOV

### Contact information

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Researcher ID: R-4761-2016

### Education

#### *B.S. with honor*

Moscow Institute of Physics and Technology - State University,  
Moscow, Russia, 1994.

#### *M.S. with honor*

Moscow Institute of Physics and Technology - State University,  
Moscow, Russia, 1996.

#### *PhD*

University of California, Davis, 2008.

#### *Cand. Phys. Math. Sci.*

Russian Academy of Sciences, 2011.

### Title

#### *Docent in Theoretical Physics*

The Ministry of Education and Science of the Russian Federation, 2017.

### Positions Held

#### **2013-now**

Assistant Professor, Skolkovo Institute of Science and Technology.

#### **2010-2017 (on Saturdays)**

Associate Professor, Department of Theoretical Physics, Moscow Institute of Physics and Technology.

#### **2010-2013**

Structural Analyst (3<sup>rd</sup> skill level), Group manager, Team-lead of two projects, Progresstech/Boeing.

#### **2008-2009**

Postdoctoral Scholar, Department of Engineering Science and Mechanics, Pennsylvania State University, Pennsylvania, USA.

#### **1996-2005**

Engineering Manager (Head of Subdepartment), Rocket-Space Corporation “Energia”, Korolev, Moscow region, Russia.

#### **1995-1996**

Researcher, N.N. Andreyev Acoustics Institute, Moscow, Russia.

### **Awards**

Boeing’s Best Engineer, 2010.

One of eight laureates of S.P.Korolev’s Competition, Korolev, Russia, 2000.

Prize-winner (1st place) of XVth Science-Technology Conference, Korolev, Russia, 1999;

Student stipend of the Acoustical Society of America, 1996.

Winner (3rd place) of Physics-Mathematics Olympiad, Moscow Engineering Physics Institute, Moscow, 1990.

Winner (1st place) of Mathematics Olympiad “MSTU-90”, Moscow State Technical University n.a. N.E. Bauman (MSTU), Moscow, 1990.

Winner of National Competition “Abiturient-90” (Mathematics and Physics), Russia, 1990.

Winner of Physics-Mathematics Olympiad, Moscow Institute of Physics and Technology - State University, Moscow, 1989.

Silver Medal, Moscow Mathematical School 315, 1990.

### **PhD theses**

Oleg V. Lebedev, *Study of deformational behavior of electrical conductivity of polymer composites with different nanofiller distribution types*, Material Science, Center for Design, Manufacturing and Materials, Skolkovo Institute of Science and Technology, Oct. 2020.

<https://www.skoltech.ru/en/education/phd-defenses/2020-2/oleg-lebedev/>

<https://www.skoltech.ru/app/data/uploads/2020/09/thesis2.pdf>

## **Master theses**

Nadezhda Kozlova (Povarnitsyna), *Theoretical study of the influence of porosity on the mechanical and physical properties of metals, ceramics, and composites*, Advanced Manufacturing and Materials, Center for Design, Manufacturing and Materials, Skolkovo Institute of Science and Technology, Jun. 2018.

Boris Voloskov, *Experimental analysis of mechanical behavior of additively manufactured stainless steel specimens*, Advanced Manufacturing and Materials, Center for Design, Manufacturing and Materials, Skolkovo Institute of Science and Technology, Jun. 2018.

Hitesh Sharma, *Multiscale modeling of effects-of-defects onto structural performance of fiber reinforced polymer composites*, Advanced Manufacturing and Materials, Center for Design, Manufacturing and Materials, Skolkovo Institute of Science and Technology, Jun. 2018.

Aleksei Shiverskii, *Experimental Studies of Electrical Conductivity of Graphene*, Advanced Manufacturing and Materials, Center for Design, Manufacturing and Materials, Skolkovo Institute of Science and Technology, Jun. 2019.

Victor Babarinde Oluseyi, *Interface Characterization of Glass Fiber-Polypropylene Matrix Composite*, Advanced Manufacturing and Materials, Center for Design, Manufacturing and Materials, Skolkovo Institute of Science and Technology, Jun. 2019.

Mahato Biltu, *Interface Characterization of Fiber Reinforced Polymer Composite in Mode II Loading*, Advanced Manufacturing and Materials, Center for Design, Manufacturing and Materials, Skolkovo Institute of Science and Technology, Jun. 2019.

Aleksandr Kukharskii, *Scaling and Correlation Phenomena of Fracture Surfaces*, Advanced Manufacturing Technologies, Center for Design, Manufacturing and Materials, Skolkovo Institute of Science and Technology, Jun. 2021.

## **Scholarships and Grants**

1. Siemens, Postdoctoral Scholarship, 2008-2009.
2. RFBR (РФФИ) 94-02-03296, Investigation of propagation of waves of high intensity in multiphase non-uniform media (Исследование распространения волн высокой интенсивности в многофазных неоднородных средах), 1994.
3. RFBR (РФФИ) 96-02-16561-a, Acoustics of multiphase media (Акустика многофазных сред), 1996.
4. RFBR (РФФИ) 16-02-00660, Effect of Long Range Interaction on the Formation of Thermodynamic and Optical Properties for Various Physical Systems (Поль

даленодействующего взаимодействия в формировании термодинамических и оптических свойств различных физических систем), 2016.

5. RFBR (РФФИ) (PI) 19-03-00369, Development of experimental and theoretical principles for design of electrically conductive nanocomposite materials with an extremely segregated structure and modeling of their architecture and properties (Разработка экспериментальных и теоретических принципов создания электропроводящих нанокомпозиционных материалов с предельно сегрегированной структурой и моделирование их пространственной структуры и свойств), 2019-2020, 2 mln.r.
6. Next Generation MIT-Skoltech (PI) 2020-2023, Multifunctional Fusion: Life-cycle enhancements via data-driven nanoengineering of advanced composite structures (Синтез мультифункциональностей: Поддержка жизненного цикла на основе цифрового нанопроектирования перспективных композитных конструкций), Skoltech 37.5 mln.r., MIT \$1.05 mln.

## Service

- ISO Standardization Committee TC 61/SC 13/WG 1, project ISO/WD 4410 “Experimental characterization of in-plane permeability of fibrous reinforcements for liquid composite moulding”.
- Associate Editor, *Frontiers in Physics*, since 2017.
- Topic Editor, MDPI *Materials*, since 2020.
- Reviewer of several journals.

## Featured in the News

1. [Press Release: Skoltech Researcher Publishes Monograph on the Application of Statistical Physics to Complex Non-Thermal Phenomenon](#) (Russian version: [Пресс-релиз: Научный сотрудник Сколтеха опубликовал монографию о применении статистической физики к сложным нетепловым явлениям](#)).
2. [Press Release: Scientists at Skoltech take a step forward in bringing carbon nanocomposites to practical industrial applications](#) (Russian version: [Ученые Сколтеха сделали новый шаг на пути к внедрению углеродных нанокомпозитов в промышленные приложения](#)).

## Books

1. Sergey G. Abaimov, *Statistical Physics of Complex Systems*, URSS, Moscow, 2012, pp. 388, ISBN 978-5-397-02309-2 (С.Г. Абаймов, Статистическая физика сложных систем, в серии Синергетика: от прошлого к будущему №57, УРСС-Либроком, Москва, 2012, стр. 388, ISBN 978-5-397-02309-2).
2. Sergey G. Abaimov, *Statistical Physics of Complex Systems*, stereotype ed., URSS, Moscow, 2013, pp. 388, ISBN 978-5-397-03872-0 (С.Г. Абаймов,

Статистическая физика сложных систем, в серии Синергетика: от прошлого к будущему №57, УРСС, Москва, 2013, стр. 388, ISBN 978-5-397-03872-0).

3. Sergey G. Abaimov, *Statistical Physics of Complex Systems*, stereotype ed., URSS, Moscow, 2016, pp. 388, ISBN 978-5-397-05208-5 (С.Г. Абаймов, Статистическая физика сложных систем, в серии Синергетика: от прошлого к будущему №57, УРСС, Москва, 2016, стр. 388, ISBN 978-5-397-05208-5).
4. Sergey G. Abaimov, *Statistical Physics of Complex Systems*, stereotype ed., URSS, Moscow, 2016, pp. 388, ISBN 978-5-397-05207-8 (С.Г. Абаймов, Статистическая физика сложных систем, в серии Синергетика: от прошлого к будущему №57, УРСС, Москва, 2016, стр. 388, ISBN 978-5-397-05207-8).
5. Sergey Abaimov, *Statistical Physics of Non-Thermal Phase Transitions*, Springer, 2015.
6. I.G. Dezhina, A.K. Ponomarev, A.S. Frolov, D.N. Zorin, S.G. Psakhie, Zafer Gurdal, A.V. Azarov, S.G. Abaimov, M.V. Belov, I.V. Danilin, A.R. Efimov, N.G. Kurakova, V.G. Zinov, L.A. Tsvetkova, O.A. Eremchenko, *Public Analytical Report on "Advanced Manufacturing Technologies"*, Delo (RANEPA), 2015, pp. 272, ISBN 978-5-7749-1064-9 (И.Г. Дежина, А.К. Пономарев, А.С. Фролов, Д.Н. Зорин, С.Г. Псахье, Зафер Гурдал, А.В. Азаров, С.Г. Абаймов, М.В. Белов, И.В. Данилин, А.Р. Ефимов, Н.Г. Куракова, В.Г. Зинов, Л.А. Цветкова, О.А. Еремченко, *Новые производственные технологии: публичный аналитический доклад*, Издательский дом "Дело" Российской академии народного хозяйства и государственной службы при Президенте Российской Федерации, Москва, 2015, стр. 272, ISBN 978-5-7749-1064-9).
7. K.I. Sipalo, A.K. Ponomarev, I.S. Akhatov, Fardad Azarmi, I.K. Uzhinsky, O.S. Aladyshev, G.E. Rudenskiy, P.S. Dorozhkin, V.V. Klochkov, I.N. Vorobiev, A.V. Baranov, E.A. Kiselev, A.V. Bernsteyn, E.V. Burnaev, A.E. Ushakov, S.V. Dubinskiy, A.A. Safonov, M.A. Pogosova, S.P. Buyakova, Ya. Ye. Shahova, A.V. Panin, M.I. Lerner, V.V. Stupnikov, A.V. Pankov, I.V. Sergeichev, S.G. Abaimov, B.N. Fedulov, E.G. Mironov, D.O. Teteryukov, A.L. Pavlov, D.A. Gorin, E.S. Prokhozdenko, A.M. Yatshenok, N.A. Gryaznov, Yu.S. Skribina, A.V. Levchenko, D.I. Makarenko, S.V. Kovriga, Z.K. Avdeeva, *Perspective Technologies for Aircraft Industry: Analytical Survey*, Nauka, 2017, pp. 462, ISBN 978-5-02-040100-6 (К.И. Сыпало, А.К. Пономарев, И.Ш. Ахатов, Fardad Azarmi, И.К. Ужинский, О.С. Аладышев, Г.Е. Руденский, П.С. Дорожкин, В.В. Клочков, И.Н. Воробьев, А.В. Баранов, Е.А. Киселев, А.В. Бернштейн, Е.В. Бурнаев, А.Е. Ушаков, С.В. Дубинский, А.А. Сафонов, М.А. Погосова, С.П. Буякова, Я.Э. Шахова, А.В. Панин, М.И. Лернер, В.В. Ступников, А.В. Панков, И.В. Сергеичев, С.Г. Абаймов, Б.Н. Федулов, Е.Г. Миронов, Д.О. Тетерюков, А.Л. Павлов, Д.А. Горин, Е.С. Приходженко, А.М. Ященок, Н.А. Грязнов, Ю.С. Скибина, А.В. Левченко, Д.И. Макаренко, С.В. Kovriga, З.К. Авдеева, *Перспективные технологии для авиационной промышленности: Аналитический обзор*, Наука, Москва, стр. 462, ISBN 978-5-02-040100-6).

8. S.G. Abaimov, I.S. Akhatov, Y.M. Belousov, A.V. Mikheenkov, I.Y. Poshchuk, *Entropy Growth in Analytical and Quantum Mechanics: Fundamentals of Mechanics*, URSS, Moscow, 2020, pp. 338, ISBN 978-5-9710-6649-1 (С.Г. Абаймов, И.Ш. Ахатов, Ю.М. Белоусов, А.В. Михеенков, И.Я. Полищук, *Рост энтропии в аналитической и квантовой механике: Фундаментальные основы механики*, УРСС-Ленанд, Москва, 2020, стр. 338, ISBN 978-5-9710-6649-1).

## Book chapters

1. D.L. Turcotte, S.G. Abaimov, R. Shcherbakov, and J.B. Rundle, Nonlinear dynamics of natural hazards, p. 557-580, in *Nonlinear Dynamics in Geosciences*, Springer, New York, 2007, ISBN 978-0-387-34917-6, e-ISBN 978-0-387-34918-3.
2. D.L. Turcotte, J.B. Rundle, M. Yoder, S.G. Abaimov, and W. Klein, Nucleation and critical phenomena, damage, and characteristic earthquakes, pp. 187-203, in *Acoustic Emission and Critical Phenomena: from Structural Mechanics to Geophysics*, eds. A. Carpinteri and G. Lacidogna, Taylor and Francis/Balkema, Leiden, 2008, ISBN 978-0-415-45082-9.
3. S.G. Abaimov, I.S. Akhatov, S.V. Lomov, Chapter 6. Detailed comparison of analytical and finite-element-based homogenization approaches for fibre-reinforced composites, pp. 141-177, in *Multi-Scale Continuum Mechanics Modelling of Fibre-Reinforced Polymer Composites*, ed. Wim Van Paepengem, vol. in Composites Science and Engineering series, Elsevier, Woodhead Publishing, 2020, ISBN 9780128189849, e-ISBN 9780128189856.

## Reviewed Publications

1. S.G. Abaimov and S.A. Rybak, Scattering of a plane wave at a sound pulse, *Acoust. Phys.*, **42**(2), 229, 1996 (С.Г. Абаймов, С.А. Рыбак, Рассеяние плоской волны на звуковом импульсе, *Акуст. ж.*, **42**(2), 262-263, 1996).
2. S.G. Abaimov and S.A. Rybak, Wave instabilities in the laminar boundary layer, *Acoust. Phys.*, **43**(5), 499, 1997 (С.Г. Абаймов, С.А. Рыбак, Волновые неустойчивости в ламинарном пограничном слое, *Акуст. ж.*, **43**(5), 581-585, 1997).
3. (Q2) S.G. Abaimov, D.L. Turcotte, R. Shcherbakov, J.B. Rundle, G. Yakovlev, C. Goltz, and W.I. Newman, Earthquakes: Recurrence and interoccurrence times, *Pure Ap. Geophys.*, **165**, 777-795, 2008, DOI 10.1007/978-3-7643-8757-0\_20.
4. (Q2) S.G. Abaimov, D.L. Turcotte, R. Shcherbakov, and J.B. Rundle, Recurrence and interoccurrence behavior of self-organized complex phenomena, *Nonlin. Proc. Geophys.*, **14**, 455-464, 2007, DOI 10.5194/npg-14-455-2007.

5. (Q1) S.G. Abaimov, D.L. Turcotte, and J.B. Rundle, Recurrence-time and frequency-slip statistics of slip events on the creeping section of the San Andreas fault in central California, *Geophys. J. Int.*, **170**, 1289-1299, 2007, DOI 10.1111/j.1365-246X.2007.03479.x.
6. (Q1) C. Goltz, D.L. Turcotte, S.G. Abaimov, R.M. Nadeau, N. Uchida, T. Matsuzawa, Rescaled earthquake recurrence time statistics: application to microrepeaters, *Geophys. J. Int.*, **176**, 256–264, 2009, DOI 10.1111/j.1365-246X.2008.03999.x.
7. (Q1) D.L. Turcotte, S.G. Abaimov, I. Dobson, J.B. Rundle, Implications of an inverse branching aftershock sequence model, *Phys. Rev. E*, **79**, 016101, 2009, DOI 10.1103/PhysRevE.79.016101.
8. (Q2) S.G. Abaimov, K.F. Tiampo, D.L. Turcotte, J.B. Rundle, Recurrent frequency-size distribution of characteristic events, *Nonlin. Proc. Geophys.*, **16**, 333-350, 2009, DOI 10.5194/npg-16-333-2009.
9. (Q2) S.G. Abaimov, Applicability and non-applicability of equilibrium statistical mechanics to non-thermal damage phenomena, *J. Stat. Mech.*, **P09005**, 2008, DOI 10.1088/1742-5468/2008/09/P09005.
10. S.G. Abaimov, Application of classical statistical mechanics to multifractals and dynamical systems, arXiv:**0805.0347**, 2008.
11. (Q2) S.G. Abaimov, Applicability and non-applicability of equilibrium statistical mechanics to non-thermal damage phenomena: II. Spinodal behavior, *J. Stat. Mech.*, **P03039**, 2009, DOI 10.1088/1742-5468/2009/03/P03039.
12. S.G. Abaimov, Critical behavior of slider-block model, arXiv:**0902.3767**, 2009.
13. S.G. Abaimov, Non-equilibrium statistical mechanics of non-equilibrium damage phenomena, arXiv:**0905.0292**, 2009.
14. S.G. Abaimov, General formalism of non-equilibrium statistical mechanics, a path approach, arXiv:**0906.0190**, 2009.
15. J. Cusumano, F. Costanzo, S. Abaimov in the text, The nature of predictability in systems with evolving damage, *Structural Health Monitoring*, **2**(1), 2010.
16. (Q2) M.R. Yoder, J.V. Aalsburg, D.L. Turcotte, S.G. Abaimov, J.B. Rundle, Statistical variability and Tokunaga branching of aftershock sequences utilizing BASS model simulations, *Pure Ap. Geoph.*, **170**(1-2), 155-171, 2013, DOI 10.1007/s00024-011-0411-2.
17. (Q1) S.G. Abaimov and J.P. Cusumano, Nucleation phenomena in an annealed damage model: Statistics of times to failure, *Phys. Rev. E*, **90**(6), 062401, 2014, DOI 10.1103/PhysRevE.90.062401.

18. (Q1) S.G. Abaimov, A.A. Khudyakova, S.V. Lomov, On the closed form expression of the Mori-Tanaka theory prediction for the engineering constants of a unidirectional fiber-reinforced ply, *Compos. Struct.*, **142**, 1-6, 2016, DOI 10.1016/j.compstruct.2016.02.001.
19. (Q1) S.G. Abaimov and I.S. Akhatov, Non-thermal quenched damage phenomena: The application of the mean-field approach for the three-dimensional case, *AIP Advan.*, **6**(9), 095116, 2016, DOI 10.1063/1.4963304.
20. S.V. Dubinskiy, F.S. Sevastyanov, A.A. Safonov, S.G. Abaimov, N.V. Rozin, B.N. Fedulov, Evaluation of mechanical properties in vacuum infused structures with micro and macro voids, *Composit. Nanostruct.*, **8**(3), 151-159, 2016 (С.В. Дубинский, Ф.С. Севастьянов, А.А. Сафонов, С.Г. Абаймов, Н.В. Розин, Б.Н. Федулов, Метод расчетного определения прочностных свойств конструкций с учетом образования микро и макро пор при вакуумной инфузии, *Композиты и наноструктуры*, **8**(8), 151-159, 2016).
21. (Q2) S.G. Abaimov, Non-equilibrium annealed damage phenomena: A path integral approach, *Front. in Phys.*, **5**, 6(1-16), 2017, DOI 10.3389/fphy.2017.00006.
22. (Q1) V.I. Betekhtin, A.G. Kadomtsev, M.V. Narykova, M.V. Bannikov, S.G. Abaimov, I.Sh. Akhatov, T. Palin-Luc, and O.B. Naimark, Experimental and theoretical study of multiscale damage-failure transition in very high cycle fatigue, *Phys. Mesomech.*, **20**(1), 78-89, 2017, DOI 10.1134/S1029959917010076 (В.И. Бетехтин, А.Г. Кадомцев, М.В. Нарыкова, М.В. Банников, С.Г. Абаймов, И.Ш. Ахатов, Т. Palin-Luc, О.Б. Наймарк, Экспериментальное и теоретическое исследование многомасштабных закономерностей разрушения при сверхмногоцикловой усталости, *Физ. мезомех.*, **20**(1), 82-93, 2017).
23. (Q1) A. Trofimov, S. Abaimov, I. Akhatov, I. Sevostianov, Effect of elastic contrast on the contribution of helical fibers into overall stiffness of a composites, *Int. J. Eng. Sci.*, **120**, 31-50, 2017, DOI 10.1016/j.ijengsci.2017.06.014.
24. (Q1) A. Trofimov, S. Abaimov, I. Akhatov, I. Sevostianov, On the bounds of applicability of two-step homogenization technique for porous materials, *Int. J. Eng. Sci.*, **123**, 117-126, 2018, DOI 10.1016/j.ijengsci.2017.11.017.
25. (Q1) I. Sevostianov, S.G. Abaimov, A. Trofimov, Replacement relations for thermal conductivities of heterogeneous materials having different matrices, *Mech. Mater.*, **121**, 50-56, 2018, DOI 10.1016/j.mechmat.2018.03.003.
26. (Q1) A. Trofimov, S. Abaimov, I. Sevostianov, Inverse homogenization problem: Evaluation of elastic and electrical (thermal) properties of composite constituents, *Int. J. Eng. Sci.*, **129**, 34-46, 2018, DOI 10.1016/j.ijengsci.2018.04.001.
27. (Q1) E. Popov, A. Trofimov, A. Goncharov, S. Abaimov, E. Chekhonin, Yu. Popov, I. Sevostianov, Technique of rock thermal conductivity evaluation on core

- cuttings and non-consolidated rocks, Int. J. Rock Mech. Mining Sci., **108**, 15-22, 2018, DOI 10.1016/j.ijrmms.2018.05.005.
- 28. (Q1) A. Trofimov, A. Markov, S.G. Abaimov, I. Akhatov, I. Sevostianov, Overall elastic properties of a material containing inhomogeneities of concave shape, Int. J. Eng. Sci., **132**, 30-44, 2018, DOI 10.1016/j.ijengsci.2018.07.004.
  - 29. (Q1) A. Markov, S. Abaimov, I. Sevostianov, M. Kachanov, S. Kanaun, I. Akhatov, The effect of multiple contacts between crack faces on crack contribution to the effective elastic properties, Int. J. Solids Struct., **163**, 75-86, 2019, DOI 10.1016/j.ijsolstr.2018.12.021.
  - 30. (Q1) D. May, A. Aktas, S.G. Advani, D.C. Berg, A. Endruweit, E. Fauster, S.V. Lomov, A. Long, P. Mitschang, S. Abaimov, D. Abliz, I. Akhatov, M.A. Ali, T.D. Allen, S. Bickerton, M. Bodaghi, B. Caglar, H. Caglar, A. Chiminelli, N. Correia, B. Cosson, M. Danzi, J. Dittmann, P. Ermanni, G. Francucci, A. George, V. Grishaev, M. Hancioglu, M.A. Kabachi, K. Kind, M. Deléglise-Lagardère, M. Laspalas, O.V. Lebedev, M. Lizaranzu, P.-J. Liotier, P. Middendorf, J. Morán, C.-H. Park, R.B. Pipes, M.F. Pucci, J. Raynal, E.S. Rodriguez, R. Schledjewski, R. Schubnel, N. Sharp, G. Sims, E.M. Sozer, P. Sousa, J. Thomas, R. Umer, W. Wijaya, B. Willenbacher, A. Yong, S. Zaremba, G. Ziegmann, In-plane permeability characterization of engineering textiles based on radial flow experiments: A benchmark exercise, Composit. A, **121**, 100-114, 2019, DOI 10.1016/j.compositesa.2019.03.006.
  - 31. (Q1) S.G. Abaimov, A. Trofimov, I.V. Sergeichev, I.S. Akhatov, Multi-step homogenization in the Mori-Tanaka-Benveniste theory, Composit. Struct., **223**, 110801, 2019, DOI 10.1016/j.compstruct.2019.03.073.
  - 32. (Q1) O.V. Lebedev, A. Trofimov, S.G. Abaimov, A.N. Ozerin, Modeling of an effect of uniaxial deformation on electrical conductance of polypropylene-based composites filled with agglomerated nanoparticles, Int. J. Eng. Sci., **144**, 103132, 2019, DOI 10.1016/j.ijengsci.2019.103132.
  - 33. (Q2) O.V. Lebedev, S.G. Abaimov, A.N. Ozerin, Modeling the effect of uniaxial deformation on electrical conductivity for composite materials with extreme filler segregation, J. Composit. Mater., 0021998319862045, 2019, DOI 10.1177/0021998319862045.
  - 34. (Q1) A. Markov, A. Trofimov, S. Abaimov, I. Akhatov, On the applicability of replacement relations to tetrahedron-like inhomogeneities, Int. J. Solids. Struct., **167**, 1-13, 2019, DOI 10.1016/j.ijsolstr.2019.02.020.
  - 35. (Q2) B. Mahato, V.O. Babarinde, S.G. Abaimov, S.V. Lomov, I. Akhatov, Interface strength of glass fibers in polypropylene: Dependence on the cooling rate and the degree of crystallinity, Polym. Compos., **41**, 1310–1322, 2020, DOI 10.1002/polb.25456.
  - 36. (Q1) S.G. Abaimov, O.V. Lebedev, V. Grishaev, B.N. Gilmutdinov, I.S. Akhatov, Edge flow profile under radial injection at constant pressure: Analytical

- predictions vs. experiment, Composit. Struct., **242**, 112101, 2020, DOI 10.1016/j.compstruct.2020.112101.
37. (Q1) B. Voloskov, S. Evlashin, S. Dagesyan, S. Abaimov, I. Akhatov, I. Sergeichev, Very High Cycle Fatigue Behavior of Additively Manufactured 316L Stainless Steel, Materials, **13**(15), 3293, 2020, DOI 10.3390/ma13153293.
38. (Q1) H.A. Butt, S.V. Lomov, I.S. Akhatov, S.G. Abaimov, Self-diagnostic carbon nanocomposites manufactured from industrial epoxy masterbatches, Composit. Struct., **259**, 113244, 2021, DOI 10.1016/j.compstruct.2020.113244.
39. N.A. Gudkov, S.V. Lomov, I.S. Akhatov, S.G. Abaimov, Influence of carbon nanotubes parameters, boundary conditions, and scaling of the representative volume on percolation and electric permeability of a nanocomposite , arXiv:2009.06013,  
<https://arxiv.org/search/?query=gudkov+abaimov&searchtype=all&source=header>
40. (Q1) A.X.H. Yong, A. Aktas, D. May, A. Endruweit, S.V. Lomov, S. Advani, P. Hubert, S.G. Abaimov, D. Abliz, I. Akhatov, M.A. Ali, S. Allaoui, T. Allen, D.C. Berg, S. Bickerton, B. Caglar, P. Causse, A. Chiminelli, S. Comas-Cardona, M. Danzi, J. Dittmann, C. Dransfeld, P. Ermanni, E. Fauster, A. George, J. Gillibert, Q. Govignon, R. Graupner, V. Grishaev, A. Guilloux, M.A. Kabachi, A. Keller, K. Kind, D. Large, M. Laspalas, O.V. Lebedev, M. Lizaranzu, A.C. Long, C. López, K. Masania, V. Michaud, P. Middendorf, P. Mitschang, S. van Oosterom, R. Schubnel, N. Sharp, P. Sousa, F. Trochu, R. Umer, J. Valette, J.H. Wang, Experimental characterisation of textile compaction response: A benchmark exercise, Composit. A, **142**, 106243, 2021, DOI 10.1016/j.compositesa.2020.106243.
41. (Q1) O.V. Lebedev, A.N. Ozerin, S.G. Abaimov, Multiscale numerical modeling for prediction of piezoresistive effect for polymer composites with a highly segregated structure, Nanomat., **11**, 162, 2021, DOI 10.3390/nano11010162.
42. (Q2) M. Owais, M.H. Javed, M.Z. Akram, W.F. Paxton, I.S. Akhatov, S.G. Abaimov, Review - Recent advances in thermally conductive paper-like films, ECS J.Solid State Sci. Tech., **10**(3), 033001, 2021. DOI 10.1149/2162-8777/abea5b.
43. (Q1) S.V. Lomov, C. Breite, A. Melnikov, F. Mesquita, Y. Swolfs, S.G. Abaimov, Clusters and avalanches of fibre breaks in a model of an impregnated unidirectional fibre bundle under tension, Int. J. Solids Struct., **225**, 111061, 2021, DOI 10.1016/j.ijsolstr.2021.111061.
44. (Q1) A.X.H. Yong, A. Aktas, D. May, A. Endruweit, S. Advani, P. Hubert, S.G. Abaimov, D. Abliz, I. Akhatov, M.A. Ali, T. Allen, D.C. Berg, S. Bickerton, C. Brauner, D. Brütsch, B. Caglar, H. Caglar, P. Causse, A. Chiminelli, A. Cohades, S. Comas-Cardona, M. Danzi, J. Dittmann, C. Dransfeld, P. Ermanni, E. Fauster, J.A. Garcia-Manrique, A. George, R. Graupner, V. Grishaev, A. Guilloux, M.

Hancioglu, W. Harizi, T. Herman, W. Huang, M.A. Kabachi, A. Keller, K. Kind, M. Laspalas, O.V. Lebedev, M. Lizaranzu, A.C. Long, K. Masania, V. Michaud, P. Middendorf, D. Salvatori, R. Schubnel, N. Sharp, M. Sozer, J. Thomas, F. Trochu, R. Umer, J. Valette, J.H. Wang, B. Willenbacher, Out-of-plane permeability measurement for reinforcement textiles: A benchmark exercise, Composit. A, **148**, 106480, 2021, DOI 10.1016/j.compositesa.2021.106480.

## Indexed Conference Papers

1. I.V. Sergeichev, S.G. Abaimov, S.S. Chugunov, E.S. Batyrshin, A.I. Mullayanov, I.S. Akhatov, Voids in fiber reinforced thermosetting polymers: Formation, structure and mechanical behavior, Proceedings of the 21<sup>st</sup> International Conference on Composite Materials (ICCM21), Xi'an, China, Aug. 20-25, 2017.
2. V. Grishaev, S.G. Abaimov, O.V. Lebedev, I.S. Akhatov, Evaluation of fiber preform permeability tensor considering flow inlet finite size, Proceedings of the 21<sup>st</sup> International Conference on Composite Materials (ICCM21), Xi'an, China, Aug. 20-25, 2017.
3. S.V. Lomov, I.S. Akhatov, J. Lee, B.L. Wardle, S.G. Abaimov, Non-linearity of electrical conductivity for aligned multi-walled carbon nanotube nanocomposites: Numerical estimation of significance of influencing factors, Proceedings of the IEEE 21st International Conference on Nanotechnology (NANO), 378-381, 2021, DOI 10.1109/NANO51122.2021 (<https://ieeexplore.ieee.org/document/9514355>).
4. H.A. Butt, M. Owais, A. Sulimov, D. Ostrizhiniy, S.V. Lomov, I.S. Akhatov, S.G. Abaimov, Y.A. Popov, CNT/epoxy-masterbatch based nanocomposites: Thermal and electrical properties, Proceedings of the IEEE 21st International Conference on Nanotechnology (NANO), 417-420, 2021, DOI 10.1109/NANO51122.2021 (<https://ieeexplore.ieee.org/document/9514322>).

## Conference Abstracts and Proceedings

1. S.G. Abaimov, D.L. Turcotte, R. Shcherbakov, and J.B. Rundle, Earthquakes: Recurrence and interoccurrence times, presented at the 2006 Fall meeting of the American Geophysical Union, San Francisco, CA, Dec. 11-15, 2006, Abstract AGUF 2006 NG51B-1024.
2. D.L. Turcotte, J.B. Rundle, R. Shcherbakov, and S.G. Abaimov, Do faults strengthen or weaken between earthquakes? Presented at the 2006 Fall meeting of the American Geophysical Union, San Francisco, CA, Dec. 11-15, 2006, Abstract AGUF 2006 NG41A-08.
3. C. Goltz, D.L. Turcotte, S. Abaimov, and R.M. Nadeau, Universal recurrence time statistics of characteristic earthquakes, presented at the 2006 Fall meeting of the American Geophysical Union, San Francisco, CA, Dec. 11-15, 2006, Abstract AGUF 2006 NG41A-03.

4. C. Goltz, D. Turcotte, S. Abaimov, Universal earthquake recurrence time statistics, presented at the 2007 Meeting of the Seismological Society of America, Kona, Hawaii, April 11-13, 2007, *Seis. Res. Let.* 78, 304, 2007.
5. S.G. Abaimov, D.L. Turcotte, and J.B. Rundle, Frequency-amplitude statistics and recurrence time interval statistics of slip events on the creeping section of the San Andreas Fault, presented at the 2007 General Assembly of the European Sciences Union, Vienna, Austria, April 15-17, 2007, *Geophys. Res. Abs.* 9, 04701, 2007.
6. S.G. Abaimov, D.L. Turcotte, and J.B. Rundle, Recurrence-time and frequency-slip statistics of slip events on the creeping section of the San Andreas Fault in central California, presented at the 2007 Meeting of the Seismological Society of America, Kona, Hawaii, April 11-13, 2007, *Seis. Res. Let.* 78, 243, 2007.
7. S.G. Abaimov, D.L. Turcotte, and J.B. Rundle, Frequency-amplitude statistics and recurrence time interval statistics of slip events on the creeping section of the San Andreas Fault, presented at the 2007 Fall meeting of the American Geophysical Union, San Francisco, CA, Dec. 10-14, 2007, Abstract AGUF 2007 NG41B-0519.
8. S.G. Abaimov, J.B. Rundle, D.L. Turcotte, An inverse BASS model for fracture, presented at the 2008 Meeting of the Seismological Society of America, Santa Fe, NM, April 16-18, 2008, *Seis. Res. Let.* 79, 292, 2008.
9. S. Abaimov, D.L. Turcotte, J. Van Aalsburg, and J.B. Rundle, Observations favor BASS, the self-similar limit of ETAS, presented at the 2008 Fall meeting of the American Geophysical Union, San Francisco, CA, Dec. 15-19, 2008, Abstract NG23A-1108 (EOS Trans. AGU 89(53)).
10. J. Cusumano, F. Costanzo, S.G. Abaimov, A. Roy, S. Roy, Coupled-field modeling and simulation of damage dynamics and failure statistics, presented at the 2009 Spring meeting of the Center of Excellence in Structural Health Monitoring, State College, PA, Jun. 11-12, 2009.
11. J. Cusumano, Q. Li, A. Roy, J. Pitt, S.G. Abaimov, Simulated Space-Time Failure Statistics for a New Coupled-Field Damage Model, presented at the 16<sup>th</sup> U.S. National Congress of Theoretical and Applied Mechanics, State College, PA, Jun. 27 – Jul. 2, 2010, Abstract USNCTAM2010-1350.
12. S.G. Abaimov, A. Roy, J. Cusumano, Multiscale Damage Evolution as a Nucleation Phenomenon, presented at the 16<sup>th</sup> U.S. National Congress of Theoretical and Applied Mechanics, State College, PA, Jun. 27 – Jul. 2, 2010, Abstract USNCTAM2010-1351.
13. S.V. Lomov, A.A. Safonov, S.G. Abaimov, F. Antonov, B. Fedulov, I.V. Sergeichev, Defects influence on mechanical properties (stiffness, strength and damage) of a fibre reinforced composite, produced by automated dry tape laying and resin infusion, presented at SAMPE Tech 2013 Conference, Wichita, Kansas, Oct. 21-24, 2013.

14. S.G. Abaimov, J.P. Cusumano, Nucleation phenomena in an annealed damage model: Statistics of times to failure, CDMM Seminar New challenges in high cycle and giga cycle fatigue, Skolkovo, Russia, Oct. 30, 2015.
15. S.G. Abaimov, J.P. Cusumano, Nucleation phenomena in an annealed damage model: Statistics of times to failure, presented at the 5<sup>th</sup> Skoltech conf. Methods for analysis and prediction of dynamics, fatigue and service life of structures under manufacturing and environmental effects, Moscow, Russia, Nov. 12-13, 2015.
16. A.A. Karabutov, D.M. Ksenofontov, I.V. Sergeichev, S.G. Abaimov, Application of laser optoacoustic method to analysis of fatigue damage of composite wingbox, presented at the 5<sup>th</sup> Skoltech conf. Methods for analysis and prediction of dynamics, fatigue and service life of structures under manufacturing and environmental effects, Moscow, Russia, Nov. 12-13, 2015.
17. S.G. Abaimov, A.A. Khudyakova, S.V. Lomov,  $E = V_f E_f + (1-V_f)E_m$ ?, Composite Materials Group Seminar, Department of Materials Engineering, KU Leuven, Belgium, Mar 2<sup>nd</sup>, 2016.
18. S.G. Abaimov, I.S. Akhatov, Damage as a phase transition: Applicability of statistical physics to damage phenomena, presented at Skoltech & MIT Conf. "Shaping The Future: Big Data, Biomedicine And Frontier Technologies", Skolkovo Innovation Center, Moscow, Russia, Apr. 25-26, 2017.
19. O.V. Lebedev, V. Grishaev, S.G. Abaimov, I.S. Akhatov, Development of standardization and certification methodology for permeability tensor measurements in anisotropic porous medium, presented at Skoltech & MIT Conf. "Shaping The Future: Big Data, Biomedicine And Frontier Technologies", Skolkovo Innovation Center, Moscow, Russia, Apr. 25-26, 2017.
20. I.V. Sergeichev, S.G. Abaimov, S.S. Chugunov, E.S. Batyrshin, A.I. Mullayanov, I.S. Akhatov, Voids in fiber reinforced thermosetting polymers: Formation, structure and mechanical behavior, presented at ICCM21, Xi'an, China, Aug. 20-25, 2017.
21. V. Grishaev, S.G. Abaimov, O.V. Lebedev, I.S. Akhatov, Evaluation of fiber preform permeability tensor considering flow inlet finite size, presented at ICCM21, Xi'an, China, Aug. 20-25, 2017.
22. V. Grishaev, S. Abaimov, O. Lebedev, B. Gilmudtinov, I. Akhatov, Uncertainty in measurement of permeability tensor of porous fibrous preform used for the liquid composite molding, 14th Flow Processes in Composite Materials, Luleå, Sweden, May 30 - Jun. 1, 2018.
23. S.G. Abaimov, A. Trofimov, I.V. Sergeichev, I.S. Akhatov, I.B. Sevostianov, The two-step homogenization in the Mori-Tanaka-Benveniste theory: The necessity, applicability, and accuracy, presented at Advanced Problems in Mechanics XLVI, St. Petersburg, Russia, Jun. 25-30, 2018.

24. A. Trofimov, I. Sevostianov, S.G. Abaimov, Overall elastic properties of a material containing inhomogeneities of concave shape, presented at Advanced Problems in Mechanics XLVI, St. Petersburg, Russia, Jun. 25-30, 2018.
25. S. Abaimov, A. Trofimov, I. Sergeichev, I. Akhatov, I. Sevostianov, Applicability of a multi-step homogenization procedure in case of the Mori-Tanaka-Benveniste theory, presented at the 55<sup>th</sup> conf. of Society of Engineering Sciences, Madrid, Spain, Oct. 10-13, 2018.
26. Anton Trofimov, Igor Sevostianov, Sergey Abaimov, Overall elastic properties of a material containing inhomogeneities of concave shape, presented at the 55<sup>th</sup> conf. of Society of Engineering Sciences, Madrid, Spain, Oct. 10-13, 2018.
27. Anatoly Markov, Sergey Kanaun, Sergey Abaimov, Igor Sevostianov, Mark Kachanov, A study of cracks with multiple partial contacts between their faces, presented at the 55<sup>th</sup> conf. of Society of Engineering Sciences, Madrid, Spain, Oct. 10-13, 2018.
28. Honor Guest Lecture on Micromechanics in Norwegian University of Science and Technology, Trondheim, Norway, Apr 2018.
29. В.Г. Гришаев, О.В. Лебедев, С.Г. Абаймов, Б.Н. Гильмутдинов, И.Ш. Ахатов, Экспериментальное исследование краевого течения при радиальной пропитке, представлено на XII Всероссийском съезде по фундаментальным проблемам теоретической и прикладной механики, Уфа, Россия, 19-24 августа 2019г.
30. Б.С. Волосков, И.В. Сергеичев, С.Г. Абаймов, И.Ш. Ахатов, Экспериментальный анализ усталостного поведения образцов коррозионностойкой стали изготовленных методом аддитивного производства, представлено на XII Всероссийском съезде по фундаментальным проблемам теоретической и прикладной механики, Уфа, Россия, 19-24 августа 2019г.
31. С.Г. Абаймов, А. Трофимов, И.В. Сергеичев, И.Ш. Ахатов, Исследование применимости мульти-шаговой гомогенизации в теории Мори-Танака-Бенвениште, представлено на XII Всероссийском съезде по фундаментальным проблемам теоретической и прикладной механики, Уфа, Россия, 19-24 августа 2019г.
32. Х.А. Батт, С.Г. Абаймов, С.В. Ломов, И.Ш. Ахатов, Экспериментальное исследование датчиков деформаций на основе нанокомпозита с углеродным нанонаполнителем, представлено на XII Всероссийском съезде по фундаментальным проблемам теоретической и прикладной механики, Уфа, Россия, 19-24 августа 2019г.
33. Н.А. Гудков, С.Г. Абаймов, С.В. Ломов, И.Ш. Ахатов, Цифровой двойник нанокомпозита: построениеnanoструктуры, эффективное КЭ моделирование и сравнение с аналитическими моделями, представлено на

XII Всероссийском съезде по фундаментальным проблемам теоретической и прикладной механики, Уфа, Россия, 19-24 августа 2019г.

34. S.G. Abaimov, A. Trofimov, I.V. Sergeichev, I.S. Akhatov, Exploring and employing multi-step homogenization in the Mori-Tanaka-Benveniste theory, presented at the 5<sup>th</sup> International Conference on Mechanics of Composites, Lisbon, Portugal, 1-4 July 2019.
35. H.A. Butt, S.V. Lomov, I.I. Dyachenko, I.S. Akhatov, S.G. Abaimov, Piezoresistivity and gauge factors of nanocomposite strain sensors manufactured from industrial carbon nanotube masterbatches, presented at the 23<sup>rd</sup> International Conference on Composite Structures (ICCS23) & 6th International Conference on Mechanics of Composites (MECHCOMP6), Porto, Portugal, 1-4 September 2020.
36. S.G. Abaimov, O.V. Lebedev, V. Grishaev, B.N. Gilmutdinov, I.S. Akhatov, The transversal profile of an edge flow in radial injection experiments at constant pressure: Theory vs. experiment, presented at the 23<sup>rd</sup> International Conference on Composite Structures (ICCS23) & 6th International Conference on Mechanics of Composites (MECHCOMP6), Porto, Portugal, 1-4 September 2020.
37. N.A. Gudkov, S.V. Lomov, I.S. Akhatov, S.G. Abaimov, Parametric modelling of electric percolation and conductivity of carbon nanotubes nanocomposite, presented at the 23<sup>rd</sup> International Conference on Composite Structures (ICCS23) & 6th International Conference on Mechanics of Composites (MECHCOMP6), Porto, Portugal, 1-4 September 2020.
38. O.V. Lebedev, A. Ozerin, S. Abaimov, Multi-scale modeling of piezoresistive effect in composites with extreme segregation of the nanoscale carbon filler, presented at the 23<sup>rd</sup> International Conference on Composite Structures (ICCS23) & 6th International Conference on Mechanics of Composites (MECHCOMP6), Porto, Portugal, 1-4 September 2020.
39. H.A. Butt, S.V. Lomov, I.S. Akhatov, S.G. Abaimov, The electric resistivity and piezoresistive response of functional carbon nanocomposites, presented at the 1<sup>st</sup> Bilateral Conference on Functional Materials (BiC-FM1), Moscow, Russia, 8-9 October, 2020.
40. N.A. Gudkov, S.V. Lomov, I.S. Akhatov, S.G. Abaimov, Parametric modelling of electric percolation and conductivity of carbon nanotubes nanocomposite, presented at the 1<sup>st</sup> Bilateral Conference on Functional Materials (BiC-FM1), Moscow, Russia, 8-9 October, 2020.
41. S. Abaimov, I. Akhatov, B.L. Wardle, Multifunctional Fusion: Life-cycle enhancements via data-driven nanoengineering of advanced composite structures, presented at the 4<sup>th</sup> Skoltech-MIT Workshop, Moscow, Russia, 13-14 October 2020.
42. H.A. Butt, S.V. Lomov, I.S. Akhatov, S.G. Abaimov, The electric resistivity and piezoresistive response of functional carbon nanocomposites, presented at the 3<sup>rd</sup> Smart Nanomaterials Conference: Advances, Innovations and Applications

(SNAIA2020), Chimie ParisTech, École Nationale Supérieure de Chimie de Paris, Paris, France, 8-11 December 2020.

43. S.V. Lomov, C. Breite, A. Melnikov, F. Mesquita, Y. Swolfs, S.G Abaimov, Clusters and avalanches in the fibre breaks model: impregnated unidirectional fibre bundle under tension, presented at Wagner's Zoominar on Composites #3, Weizmann Institute of Science, Rehovot, Israel, 26 January 2021.
44. H.A. Butt, S.V. Lomov, I.S. Akhatov, S.G. Abaimov, Hurdles and challenges in manufacturing conductive nanocomposites using graphene/derivative masterbatches, presented at the 11<sup>th</sup> International Conference on Key Engineering Materials (ICKEM 2021), Skolkovo Institute of Science and Technology, Moscow, Russia, 26-29 March 2021.
45. N.A. Gudkov, S.V. Lomov, I.S. Akhatov, S.G. Abaimov, The sensitivity of computational electrical response in CNT-polymer self-diagnostic nanocomposites to input model parameters, presented at the 2<sup>nd</sup> International Conference on Theoretical, Analytical and Computational Methods for Composite Materials and Composite Structures (ICOMP2021), 5-7 March 2021.
46. S.V. Lomov, C. Breite, A. Melnikov, F. Mesquita, Y. Swolfs , S.G. Abaimov, The catastrophic avalanche of fibre breaks in an impregnated fibre bundle model, presented at the 10<sup>th</sup> International Conference on Composite Testing and Model Identification (CompTest2021), 18-20 May 2021.
47. S. G. Abaimov, C. Breite, A. Melnikov, F. Mesquita, Y. Swolfs, S. V. Lomov, Damage development prior to failure in impregnated fiber-bundle model: correlative behavior in space and time, presented at the 10<sup>th</sup> International Conference on Composite Testing and Model Identification (CompTest2021), 18-20 May 2021.
48. S. Lomov, C. Breite, A. Melnikov, F.M.G. Mesquita, Y. Swolfs, S. Abaimov, Clustering of breaks and avalanches in impregnated fiber bundles as precursors of failure, presented at the 24<sup>th</sup> International Conference on Composite Structures (ICCS24), University of Porto, Porto, Portugal, 14-16 June 2021.