CURRICULUM VITAE

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EXPERIENCE and EDUCATION

2001 – current	Department of Physical Foundations of Electronic Engineering in the Kharkov National University of Radio Electronics, Kharkov, Ukraine. PhD Student. Preliminary title of the doctoral thesis is "Carrier transport processes in active regions of semiconductor lasers and optical amplifiers based on asymmetric multiple quantum well heterostructures".
1996 - 2001	Student at the Electronics Faculty in the Kharkov State Technical University of Radio Electronics, Kharkov, Ukraine. Graduated with honors from the Kharkov National University of Radio Electronics as certified electronics engineer in the area of lasers and optoelectronic techniques (B. S. (2000) and Electron. Eng. (2001)

SHORT TERM COURSES

Short term student (July 29, 2004 – August 27, 2004) of the University of Jyväskylä, Finland.
Short term student (October 04, 2005 – November 24, 2005) of the Goethe Institute, Mannheim, Germany

ELECTRONIC ENGINEER THESIS

Title: "Dynamical model for a quantum dot laser"
- Dynamical models for quantum well and quantum dot lasers;
- Theory of carrier transport in low-dimensional structures;
- Methods and technological equipment for preparation of low-dimensional structures;

PROFESSIONAL ACTIVITY AND INTERESTS

It is well known that processes of carrier transport, their capture and emission are one of dominant limitation for high bit-rate current modulation of low-dimensional lasers. Quantum well semiconductor optical amplifiers in the mode of amplification of high bit-rate signal sequences are also subject to this

limitation. From this point of view it is important to understand physics of transport processes and to have models for investigation of transport processes. Therefore, main subject of my interests is computation of carrier capture, escape, relaxation rates. Adjacent field of physics required to solve these problems, and therefore are in focus of my interest, are general theory of quantum well structures; dynamical behavior of semiconductor lasers and amplifiers; simulation and optimization of the laser and amplifier structures including strained and asymmetrical multiple quantum wells.

GRANTS

Grant of the IEEE Laser and Electro-Optics Society Student Project Program 2002 (Project leader).
IEEE Laser and Electro-Optics Society grant 2003 for Student Project presentation during LEOS Annual Meeting 2003 (Tucson, Arizona, USA)

INTAS grant for participation in 14th Jyväskylä Summer School, Finland. Courses: Spintronics: Fundamentals and Applications, Tunneling in Solids, Introduction to Nanomechanics, Introduction to Quantum Transport and Mesoscopics.

MEMBERSHIP

IEEE - The Institute of Electrical and Electronic Engineers (USA)
LEOS - Laser and Electro-Optics Society (USA)
Secretary of IEEE Student Branch, Chairman of IEEE/LEOS Student Branch Chapter
Leader of the Student Project 2002-2003 "Interactive teaching software suite for the basic photonics components studying"
OSA - Optical Society of America (USA)
SPIE - The International Society for Optical Engineering

Member of the Organizing Committee for IEEE-LEOS Annual International Conference on Laser and Fiber Optical Networks Modeling, LFNM (Ukraine)
Member of the Organizing Committee for IEEE-LEOS International Conference on Advanced Optoelectronics and Lasers, CAOL (Ukraine)

AWARDS

N. A. Kutsyn's philantropical fund for project and support of the authors of intellectual property **Award in 2001**: Best diploma work (thesis) for Electronics Engineer degree "Dynamical model for a quantum dot laser".

LANGUAGES

Russian, Ukrainian, English, German

PERSONAL

Date of birth: 18 November 1978, married, good health.

LIST OF PUBLICATIONS

JOURNAL PAPERS

2002

1. Investigation of dynamical properties of quantum dot lasers (in Russian)
   Lysak V. V., **Shulika O. V.**, Sukhoivanov I. A.
   Radiotekhnika: All-Ukrainian Scientific Interdisciplinary Magazine, 2002, № 125, pp. 129-133;

2. Light localization in a defect of the photonic crystal (in Russian)
   Ivanov P. S., Unold H., **Shulika O. V.**, Kublik A. V., Sukhoivanov I. A.
   Radioelektronika i informatika (Radio electronics and informatics) № 3(20), 2002, pp. 42-45.

3. LaserCAD III – towards comprehensive simulation of quantum well lasers (in Russian)
   Shulika O. V., Ivanov P. S., Safonov I. M., Dyogtyev A. V., Lysak V. V., Kublik A. V., Sukhoivanov I. A.
   International scientific and technical journal "Optoelectronic information-power technologies", №1(3), 2002,pp. 125-130;

2003

4. Web-oriented interactive environment for distance education in study of semiconductor lasers
   I. N. Keleberda, **A. V. Shulika**, V. V. Sokol, I. M. Safonov, T. S. Sakalo, P. S. Ivanov, I. A. Sukhoivanov, N. S. Lesna
   XII IEEE-SPIE Symposium on Photonics and Web Engineering, Wilga, Poland, 21-25 May 2003. Proceedings of SPIE Volume: 5484 *Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments II*. Editor: Ryszard S. Romaniuk. pp. 561-567. ISSN 0277-786X; ISBN 0-8194-5415-X.
   http://bookstore.spie.org/index.cfm?fuseaction=DetailVolume&productid=561679&CFID=907097&CFTOKEN=90654248

5. Interactive teaching software suite for the basic photonics components studying
   Shulika A.V., Ivanov P. S., Keleberda I. N.
   LEOS Newsletter, Vol. 17, No. 4, August 2003, pp. 15-19
   http://www.ieee.org/organizations/pubs/newsletters/leos/aug03/career.html

2004

6. Tunneling in semiconductor optical amplifiers based on asymmetrical multiple quantum well structures (in Russian)
   Shulika O. V., Sukhoivanov I. A., Lysak V. V.
   Radiotekhnika: All-Ukrainian Scientific Interdisciplinary Magazine, 2004, № 137, pp. 164-171;

7. The influence of gain nonlinearities on distortion in semiconductor lasers
   Vladimir V. Lysak, Richard Schatz, **Aleksey V. Shulika**, Igor A. Sukhoivanov, O. Kjebon
   Advanced Optoelectronics and Lasers, Proceedings of SPIE Volume: 5582, pp. 171-178

http://bookstore.spie.org/index.cfm?fuseaction=DetailVolume&productid=582570&CFID=1171476&CFTOKEN=20151990

8. Capture area of charge carriers in low-dimensional semiconductor lasers and amplifiers under small-signal modulation (in Russian)
O. V. Shulika
Radioelektronika i informatika (Radio electronics and informatics), №2, April-July 2004, pp. 51-53.

9. Model for self-consistent analysis of arbitrary MQW structures
I. M. Safonov, **A. V. Shulika**, I. A. Sukhoivanov, V. V. Lysak
Optics East Symposium, conference on Physics and Applications of Optoelectronic Devices, October 25-28, 2004, Philadelphia, Pennsylvania, USA, Proceedings of SPIE Volume: 5594, pp.33-44. http://xxx.lanl.gov/abs/cond-mat/0411442

10. Ultrafast dynamics in asymmetrical multiple quantum well SOAs
V. V. Lysak, H. Kawaguchi, I. A. Sukhoivanov, Y. T. Lee, T. Katayama, **A. V. Shulika**
Optics East Symposium, conference on Physics and Applications of Optoelectronic Devices, October 25-28, 2004, Philadelphia, Pennsylvania, USA, Proceedings of SPIE Volume: 5594, pp.21-32.

11. Investigation of negative dispersion in chirping mirrors of arbitrary order (in Russian)
Lysak V. V., Sukhoivanov I. A., Yakushev S. O., **Shulika O. V.**
Radioelektronika i informatika (Radio electronics and informatics), №3(28) 2004, p.54-59

12. Modeling and computation of characteristics of quantum-well vertical-cavity surface-emitting lasers (in Ukrainian)
Ruzhemyako V. P., Lysenko G. L., Abudaya U. F., **Shulika O.V.**, Tuzhanskyi S.E.
International scientific and technical journal "Optoelectronic information-power technologies", №1(7), 2004,pp. 73-82;

2005

13. Quantum capture area in layered quantum well structures
Oleksiy V. Shulika, Ivan M. Safonov, Igor A. Sukhoivanov, Volodimir V. Lysak
Microelectronics Journal (Elsevier Pub.), Vol. 36, 2005, pp. 350–355;

14. Ultrafast Gain Dynamics in Asymmetrical Multiple Quantum-Well Semiconductor Optical Amplifiers
Vladimir V. Lysak, Hitoshi Kawaguchi, Igor A. Sukhoivanov, Takeo Katayama, **Aleksey V. Shulika**
IEEE Journal of Quantum Electronics, Vol. 41, No. 6, June 2005, pp. 797-807;

15. New demultiplexer based on 2D photonic crystals for high-density all-optical photonic integrated circuits (in Russian)
Guryev I. V., Sukhoivanov I. A., **Shulika O. V.**, Kublik A. V.
Radiotekhnika: All-Ukrainian Scientific Interdisciplinary Magazine, №143, 2005, p.107-112

16. Influence of axial approximation on the density of states in quantum well structures (in Russian)
Klymenko M. V., **Shulika O.V.**, Safonov I. M., Sukhoivanov I. A.
Radiotekhnika: All-Ukrainian Scientific Interdisciplinary Magazine, №143, 2005, p.101-106

17. Computation of gain spectra for single quantum well structures (in Russian)
Klymenko M. V., **Shulika O. V.**, Safonov I. M. Suhoivanov I. A.
Radioelektronika i informatika (Radio electronics and informatics), №3(32) 2005, p.43-46

18. Reflectivity of oxide window distributed Bregg reflectors (in Russian)
Kovbasa A. A., Zinkvska I. O., Lysak V. V., **Shulika O. V.**, Sukhoivanov I. A.
Radioelektronika i informatika (Radio electronics and informatics), №3(32) 2005, p.55-61

19. Recurrence expression for transmission matrix of a chirping mirror (in Russian)
Yakushev S. O., **Shulika O. V.**, Lysak V. V., Sukhoivanov I. A.
In press. Radioelektronika i informatika (Radio electronics and informatics)

2006

20. Carrier Tunneling in Complex Asymmetrical Multiple Quantum Well Semiconductor Optical Amplifiers
V. V. Lysak, I. A. Sukhoivanov, **O. V. Shulika**, I. M. Safonov, Y.T.Lee
IEEE Photonics Technology Letters, June, №12, Vol. 18, 2006, p.1362-1364

21. Numerical Model for Investigation of Modulation Properties of Semiconductor Lasers
Ivan M. Safonov, **Oleksiy V. Shulika**, Igor A. Sukoivanov, and Sergiy I. Petrov
Submitted to International Journal of Numerical Analysis and modeling

22. Improvement of characterization accuracy of the nonlinear photonic crystals using finite elements-iterative method
Igor V. Guryev, **Oleksiy V. Shulika**, Igor A. Sukhoivanov, Olga V. Mashoshina
Applied Physics B – Lasers and Optics, Special Issue: "Optics on the Nanoscale: Principles, Instrumentation and Applications", № 1-2, Vol. 84, July 2006, p. 83-87

CONFERENCES

2000

1. Heterostructures based on quantum dots (in Russian)
   Shulika A. V., Lysak V. V.
   Proceedings of International Forum of Youth Scientists "Radio electronics and youth in the XXI century", KhTURE, Kharkov, Ukraine, 2000, Vol. 1, pp. 181-182;

2. One-level model for quantum dot lasers (in Russian)
   Lysak V. V., **Shulika A. V.**, Sukhoivanov I. A.
   Proceedings of International conference "Theory and techniques for information transfer, receiving and processing: New information technologies" KhTURE, Kharkov, Ukraine, 2000, pp. 578-579;

2001

3. LaserCAD III – software packege for quantum well laser simulation
   P. Ivanov, I. Sukhoivanov, V. Lysak, A. Prigoda, Ye. Kokhan, Ye. Zaslonkin, **A.Shulika**, A. Kublik
   The Experience of Designing and Application of CAD Systems in Microelectronics Conference, CADSM'01, 12-17 February, 2001, Lviv - Slavsko, Ukraine, Proc., pp. 175-178.

4. Quantum dot laser: Influence of carrier capture and escape processes on dynamical characteristics (in Russian)
   Shulika A. V., Lysak V. V.
   Proceedings of International Forum of Youth Scientists "Radio electronics and youth in the XXI century", KhTURE, Kharkov, Ukraine, 2001, Vol. 1, pp. 158-159;

5. Five-level dynamical model for quantum dot lasers: Comparison to experiment (in Russian)
   Shulika A. V., Lysak V. V., Sukhoivanov I. A., Kononenko V. K.
   Proceedings of International conference "Theory and techniques for information transfer, receiving and processing: New information technologies" KhTURE, Kharkov, Ukraine, 2001, pp. 152-153;

6. A five-level time-domain model for quantum dot lasers: influence of carrier capture and escape processes on dynamic and static characteristics
   Lysak V. V., **Shulika A. V.**, Sukhoivanov I. A.
   Proceedings of International Workshop on Laser and Fiber-Optical Networks Modeling, KhTURE, Ukraine, 2001, pp. 64-68;

7. Influence of carrier capture-escape processes on dynamical behavior and characteristics of quantum dot laser
   Lysak V. V., **Shulika A. V.**, Sukhoivanov I. A.
   Proceedings of International Conference on Transparent Optical Networks, Cracow, Poland, 2001, pp.28-31;

8. A five-level time-domain model for quantum dot lasers: comparison to experiment
   Shulika A. V., Lysak V. V., Sukhoivanov I. A.
   Proceedings of the First International Young Scientists Conference on Applied Physics, Kiev, Ukraine, 2001, pp.82-83;

2002

9. Integration of teaching resource and applied package LaserCAD III under distant learning build up (in Russian)
   P. Ivanov, I. Keleberda, **A. Shulika**, V. Sokol
   Conference on Physical and Computer Technologies in National Economy, 2002, p.202-204;

10. Carrier transport in quantum dot structures
    Shulika A. V., Lysak V. V.
    International Workshop on Laser and Fiber-Optical Networks Modeling, June 3-5, 2002, Kharkov, Ukraine, pp. 178-180.

11. Mathematical modeling of unsymmetrical optical mirrors for femtosecond impulse generation
    I. A. Sukhoivanov, V. V. Lysak, **A. Shulika**
    International Conference on Mathematical Methods in Electromagnetic Theory, September 10-13, 2002, Kiev, Ukraine, Vol. 1, pp.236-238.

2003

12. Time-domain numerical model for asymmetrical multiple-quantum well traveling-wave semiconductor optical amplifiers
    V. Lysak, I. Sukhoivanov, **A. Shulika**, H. Kawaguchi
    Conference on Lasers and Electro Optics, CLEO'03, paper CJ3T

13. Novel cross-platform laser simulator for quantum well lasers investigation
    A. V. Shulika, P. S. Ivanov, I. M. Safonov, A. V. Kublik, I. A. Sukhoivanov
    The Experience of Designing and Application of CAD Systems in Microelectronics Conference, CADSM'03, Proceedings, p. 175-178.

14. Advanced versatile software tool for comprehensive studying of quantum-well semiconductor lasers
    A. V. Shulika, I. M. Safonov, P. S. Ivanov, I. A. Sukhoivanov
    presented at 10th International Conference Mixed Design of Integrated Circuits and Systems, MIXDES'03, Lodz, 2003. pp. 661-664.

15. LaserCAD III – web-oriented software tool for distance learning in study of semiconductor structure properties
    Shulika A. V., Safonov I.M., Ivanov P. S., Sukhoivanov I. A., Lysak V. V.
    IEEE/LEOS International Conference on Numerical Simulation of Semiconductor Optoelectronic Devices, NUSOD'03, October 13-16, 2003, Komaba Campus, the University of Tokyo, Tokyo, Japan, paper WP3, pp.55-56.

16. Interactive teaching software suite for the basic photonics components studying
    Shulika A.V.
    Exhibition Guide, Student Project Presentation, LEOS Annual Meeting, Tucson, Arizona, 26-30 October, 2003.

17. Tunneling peculiarities in asymmetrical quantum-well structures
    A. V. Shulika, V. V. Lysak, I. A. Sukhoivanov

International Workshop on Laser and Fiber-Optical Networks Modeling, September 19-20, 2003, Alushta, Crimea, Ukraine, pp. 242.

18. Comprehensive simulation of MQW semiconductor lasers by using LaserCAD III
A. V. Shulika, I. M. Safonov, P. S. Ivanov, V. V. Lysak, I. A. Sukhoivanov, N. S. Lesna
International Workshop on Laser and Fiber-Optical Networks Modeling, September 19-20, 2003, Alushta, Crimea, Ukraine, pp. 80-83.

19. Using Java in engineering and scientific computations and in designing systems
A. Ya. Kuzemin, N. D. Minajlo, I. M. Safonov, **A. V. Shulika**
International Workshop on Laser and Fiber-Optical Networks Modeling, September 19-20, 2003, Alushta, Crimea, Ukraine, pp. 93-94.

20. Carrier recovery dynamics after ultrashort pulse propagation in asymmetrical multiple quantum well traveling wave semiconductor optical amplifiers
V. V. Lysak, H. Kawaguchi, I. A. Sukhoivanov, **A. V. Shulika**
International Workshop on Laser and Fiber-Optical Networks Modeling, September 19-20, 2003, Alushta, Crimea, Ukraine, pp. 176-178.

21. Influence of gain nonlinearity on the second order harmonic distortion in semiconductor lasers
V. V. Lysak, R. Schatz, **A. V. Shulika**, I. A. Sukhoivanov,
International Workshop on Laser and Fiber-Optical Networks Modeling, September 19-20, 2003, Alushta, Crimea, Ukraine, pp. 236-238.

22. Application of the full–vector weighted–index method for optical analysis of VCSEL microcavity
A. A. Kovbasa, **A. V. Shulika**, L. V. Lysak
International Workshop on Laser and Fiber-Optical Networks Modeling, September 19-20, 2003, Alushta, Crimea, Ukraine, pp. 249-251.

23. Ultrafast gain dynamics in asymmetrical multiple quantum-well SOAs
V. V. Lysak, H. Kawaguchi, T. Katayama, I. A. Sukhoivanov, **A. V. Shulika**
at the 2003 IEICE Society Conference 23-26 September 2003, Niigata University, Niigata, Japan, paper C-4-19, p. 295

24. Numerical Simulation of Gain Properties and Ultrafast Dynamics in Asymmetrical Multiple Quantum Well SOAs
V. V. Lysak, H. Kawaguchi, I. A. Sukhoivanov, T. Katayama, **A. V. Shulika**
2nd Meeting on "Creation of Ultrahigh-Speed Optical Buffer Memory with Shift Register"
Yamagata University, Yonezawa, Japan, November 13-14, 2003, pp-49-52.

25. Enlargement of functionality of distance learning course on example of LaserCAD III software application (in Russian)
V. V. Sokol, S. D. Makovetsky, I. M. Safonov, **A. V. Shulika**, N. S. Lesna, I. A. Sukhoivanov
International scientific and practical conference "Unified information space", Dnepropetrovsk, Ukraine, December 3-4, 2003, pp. 51-54;

2004

26. Computation of potential profile for complex heterostructures with quantum wells for semiconductor nanodevices
    Klimenko M. V., **Shulika A. V.**, Sukhoivanov I. A.
    The 5th International Kharkov Symposium on Physics and Engineering of Microwaves, Millimeter and Submillimeter waves, Kharkov, Ukraine, June 21-26, 2004, Paper II-1, pp. 342-344;

27. Capture area in quantum well structures
    Shulika A. V., Sukhoivanov I. A., Lysak V. V.
    International Conference on Transparent Optical Networks, Wroclaw, Poland, July 4 - 8, 2004, Paper Tu.P.11, p.371-374;

28. Novel Method for Computation of Frequency Characteristics of Semiconductor Lasers
    Safonov I. M., **Shulika A. V.**, Sukhoivanov I. A., Kublik A. V., Ivanov P. S.
    International Symposium on Signals, Systems, and Electronics (ISSSE'04) August 10-13, 2004, Johannes Kepler University of Linz, Austria. Electronic publication, ISBN 3-9501491-3-9.

29. Analysis of reflection properties of bragg mirror with oxide window
    A.A. Kovbasa, V.V. Lysak, **A.V. Shulika**
    International Conference on Laser and Fiber-Optical Networks Modeling, September 6-9, 2004, Kharkov, Ukraine, pp. 133.

30. Applicability of the piecewise-linear approximation of the potential profile of undoped MQW heterostuctures
    Safonov I. M., **Shulika A. V.**, Sukhoivanov I. A.
    5th International Scientific and Technical Conference Quantum Electronics (QE-2004), November 22–25, 2004, Byelorussian State University, Minsk, Belarus, p.108.

31. Quantum Capture Area in Layered Quantum Well Structures
    Aleksey V. Shulika, Ivan M. Safonov, Igor A. Sukhoivanov
    5th International Conference on Low Dimensional Structures and Devices, Cancun, Mayan Riviera, Mexico, 12-17 December 2004, Book of abstracts, Abstract Tu-P85, p. 141.

2005

32. On design of wavelength division multiplexers in 2D photonic crystals
    Sukhoivanov I. A., Guryev I. V., **Shulika O. V.**
    International Conference on Laser and Fiber-Optical Networks Modeling, LFNM 2005, September 15-17, 2005, Yalta, Crimea, Ukraine, pp. 38-41;

33. Effect of band structure anisotropy on gain spectra of SQW lasers and amplifiers
    Klimenko M. V., **Shulika O. V.**, Mashoshyna O. V., Sukhoivanov I. A.
    International Conference on Laser and Fiber-Optical Networks Modeling, LFNM 2005, September 15-17, 2005, Yalta, Crimea, Ukraine, pp. 35-37;

34. Band structure computation of asymmetric multiple quantum wells
    Klimenko M. V., **Shulika O. V.**, Safonov I. M.

International Conference on Laser and Fiber-Optical Networks Modeling, LFNM 2005, September 15-17, 2005, Yalta, Crimea, Ukraine, pp. 64-67;

35. Comprehensive modification of AMQW-SCH for the efficient electrons capture *(Invited)*
Safonov I. M., **Shulika O. V.**, Sukhoivanov I. A.
International Conference on Laser and Fiber-Optical Networks Modeling, LFNM 2005, September 15-17, 2005, Yalta, Crimea, Ukraine, pp. 16-22;

36. Anisotropy of the valence subbands in quantum well structures: effect on density of states characteristic
Klimenko M. V., Safonov I. M., **Shulika O. V.**, Sukhoivanov I. A.
International Conference on Numerical Simulation of Optoelectronic Devices, NUSOD 2005, September 19-22, 2005, Berlin, Germany, pp. 73-74;

2006

37. Continuous band heterostructures: a new concept for development of low-loss distributed Bragg reflectors for optoelectronic devices (Invited)
I.M. Safonov, I.A. Sukhoivanov, **O.V. Shulika**, A.A. Dyomin, S.O. Yakushev, M.V. Klymenko, S.I. Petrov, V.V. Lysak
International Conference on Transparent Optical Networks (ICTON 2006): 1st Nanophotonics for All-Optical Networking Workshop (NAON 2006), Nottingham, United Kingdom June 18-22, 2006, Paper Paper We.C2.2, p. 193-198.

SCIENTIFIC REPORTS

Final research report “Investigation of methods for creation of optoelectronic laser-based devices for the distance-untied high-integrated information-measuring system”, state budget project № 141-3, chapters 2, 3.