CURRICULUM VITAE

Mykhailo V. Klymenko

PhD. Student

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PERSONAL

Date of birth: 25 December 1982

Not married

EDUCATION

2007-2008	Education and investigation project realized in Philipps-University, Marburg (supported by DAAD)
Since 2005	PhD Student in Radio physics at the Department of Physical Foundations of Electronic Engineering in the Kharkov National University of Radio Electronics, Kharkov, Ukraine.
2005	Graduated with the highest honors from the Kharkov National University of Radio Electronics as a master in the area of lasers and optoelectronic techniques.
2004	Graduated with the highest honors from the Kharkov National University of Radio Electronics as a bachelor in the area of lasers and optoelectronic techniques.
2000-2005	Student at the Electronics Faculty in the Kharkov National University of Radio Electronics, Kharkov, Ukraine

MASTER'S DEGREE THESIS

Title: “Investigation of the gain spectra of quantum wells in the frame of the kp-method within the envelope function approximation”

- Review of approaches to the calculation of energy spectra in quantum well structures which use kp-method in connection with envelope function approximation;
- Synthesis of the computational gain model based on Fermi’s Golden Rule;
- Development of the computational algorithm based on the Galerkin method to obtaining energy spectra of the quantum well structures taken in-plane dispersion, band mixing and band anisotropy into account;

PROFESSIONAL ACTIVITY:

- Investigation of the contact effects at heterojunctions
- Taking part in the development of LaserCAD software (project IEEE/LEOS for LEOS Student Chapter: Student Project 2002-2003 “Interactive teaching software suite for the basic photonics components studying”)
- Simulation of the quantum well structures, their electronic and optical properties
- Development of the efficient mathematical model for the computation of the energy spectra of the structures with quantum confinement effects
- Theoretical investigation of the effects of band structure anisotropy in quantum wells
- Investigation of the capture/escape effects in SCH QWs
- III-V semiconductor materials engineering

LANGUAGES

Ukrainian

Russian

English (certificate “test of English as a foreign language”, certified by International House Language Center, Kharkov, Ukraine)

German (Elementarstufe 2, A1, certified by “Speak and Write” language course, Marburg, Germany)

MAMBERSHIPS

IEEE - The Institute of Electrical and Electronic Engineers (USA)
LEOS - Laser and Electro-Optics Society (USA)

Staff Member of the Joint Organizing Committee IEEE-LEOS International Conference on Advanced Optoelectronics and Lasers, CAOL (Ukraine-2003)
Staff Member of the Joint Organizing Committee IEEE-LEOS 6th International Conference on Laser and Fiber-Optical Networks Modeling, LFNM (Ukraine-2004)

AWARDS, STIPENDIUMS AND GRANTS

From 2004 to 2005 The Stipendium of Verkhovna Rada (Parliament of Ukraine) awarded for high student activity and scientific results.

Travel grant of the IEEE/LEOS Chapter Ukraine for the conf. CAOL'2003, 16-20 Sep. 2003, Alushta, Ukraine

Young scientist travel grant of the IEEE East Ukraine Joint Chapter awarded in partial support of attendance at the International Conference NUSOD 2005 in Berlin and presentation of the paper entitled “Anisotropy of valence subbands in quantum well structures: effect on density of states characteristics”.

2007-2008 DAAD scholarship

PUPLICATIONS

Complete publication list includes 19 scientific works, among them:

3 journal papers in English;
3 journal papers in Russian;
4 conference publications in Russian;
13 conference publications in English;

SKILLS

- Efficient application of mathematical calculus to physical problems
- Quick familiarization of new mathematical and physical theories
- Experience in MATLAB, FEMLAB, C++, Fortran, Linux scientific computations

INTERESTS

Quantum-field theory, philosophy, art

LIST OF PUBLICATIONS

Mykhailo Klymenko

Blue color denotes journal papers

2003

1. Klimenko M.V. (scientific adviser Sukhoivanov I.A.) «The density of states computation in the semiconductors with quantum confinement effects», Proceedings of 7th International Forum of Youth Scientists “Radio electronics and youth in the XXI century”, KhTURE, Kharkov, Ukraine, 2003 (in Russian)

2004

2. Klimenko M.V. (scientific adviser Sukhoivanov I.A.) «Calculation of the potential profile of complicated heterostructures», Proceedings of 8th International Forum of Youth Scientists “Radio electronics and youth in the XXI century”, KhTURE, Kharkov, Ukraine, 2004 (in Russian)
3. Klimenko M.V., A.V. Shulika, I.A.Sukhoivanov “Computation of potential profile for complex heterostructures with quantum wells for semiconductor nanodevice”, The proceedings of The Fifth International Kharkov Symposium on Physics and Ingineering of Microwaves, Millimeter and Submillimeter Waves, 2004

2005

4. Klimenko M.V. «Calculation of the subbands of the semiconductor heterostructure with quantum confinement effects applying cutset method to isoenergetic surfaces of bulk semiconductors», Proceedings of 9th International Forum of Youth Scientists “Radio electronics and youth in the XXI century”, KhTURE, Kharkov, Ukraine, 2005 (in Russian)
5. Klimenko M.V., Grishenko S.V. «Investigation of the influence of the spin-orbit coupling on gain spectra of injection laser», Proceedings of 9th International Forum of Youth Scientists “Radio electronics and youth in the XXI century”, KhTURE, Kharkov, Ukraine, 2005 (in Russian)
6. Safonov I.M., Klimenko M.V. and Sukhoivanov I.A. “Modification of confinement area for efficient electrons capture in MQW SQH”, Proc. European Conference on Lasers and Electro-Optics (CLEO®/Europe), Munich, Germany 12-17 June 2005, vol. 29B, paper EA-539 (CLEO 2005)
7. Klimenko M.V., Safonov I.M., Shulika A.V. and Sukhoivanov I.A. “Anisotropy of the valence subbands in quantum well structures: effect on density of states characteristic”, Proc of 5th IEEE/LEOS Conf. Numerical Simulation of Optoelectronic devices, NUSOD, 19-22 Sept.2005, Berlin Germany p.73-74 (NUSOD 2005)
8. Klimenko M.V., Safonov I.M. and Shulika A.V. “Band structure computation of asymmetrical multiple quantum wells”, Proc. International Conference on Laser and Fiber-Optical Networks Modeling, September 15-17, 2005, Yalta, Crimea, Ukraine, pp. 64-67; (LFNM 2005)
9. Klimenko M.V., Shulika O.V., Mashoshyna O.V. and Sukhoivanov I.A. “Effect of band structure anisotropy on gain spectra of SQW lasers and amplifiers”, Proc. International Conference on Laser and Fiber-Optical Networks Modeling, September 15-17, 2005, Yalta, Crimea, Ukraine, pp. 35-37 (LFNM 2005)

10. Klimenko M.V., Shulika A.V., Safonov I.M. and Sukhoivanov I.A., “Gain spectra computation for semiconductor structures with single quantum well”, All-Ukraine Scientific journal “Radiotechnika”, 2005 (in Russian)
    Klimenko M.V., Shulika A.V., Safonov I.M. and Sukhoivanov I.A., “Gain spectra computation for semiconductor structures with single quantum well”, Telecommunication and Radio Engineering, vol. 65, 2006 (in English), pp. 1217-1226
11. Klimenko M.V., Shulika A.V., Safonov I.M. and Sukhoivanov I.A., “Influence of the axial approximation on density of states of the quantum-size structures”, All-Ukraine Scientific journal “Radioelectronika and Informatika”, 2005 (in Russian)

2006

12. Safonov I.M., Klymenko M.V. and Sukhoivanov I.A. “Enhancement of electron capture efficiency in MQW structure”, SPIE Symposium on Photonics Europe : Semiconductor Lasers and Laser Dynamics II , 3-6 April 2006 Strasbourg, France. Paper Number: 6184-57, p. 105-106
13. Safonov I.M., Sukhoivanov I.A., Shulika O.V., Dyomin A.A., Yakushev S.O., Klymenko M.V., Petrov S.I., and Lysak V.V., “Continuous Band Heterostructures: A New Concept for Development of Low-loss Distributed Bragg Reflectors for Optoelectronic Devices”, Proc of 8th International Conference on Transparent Optical Networks, ICTON’2006, paper We.C2.2, vol.2, pp. 193-198
14. Klymenko M.V., Shulika O.V., Safonov I.M., and Sukhoivanov I.A., “Revelation of couples of semiconductor materials without the band offsets and with the differing electron effective masses,” Proc. of Conference on Laser and Fiber-Optical Networks Modeling, LFNM’06, June 29 –July 1, 2006, Kharkov, Ukraine, pp. 414-417.
15. M.V. Klymenko, I.M. Safonov, O.V. Shulika, and I.A. Sukhoivanov, “Band structure of the effective-mass superlattice,” *Proc. of Conference on Laser and Fiber-Optical Networks Modeling*, LFNM’06, June 29 –July 1, 2006, Kharkov, Ukraine, pp. 411-414.
16. I.M.Safonov, M.V. Klymenko, O.V. Shulika, and I.A. Sukhoivanov, “Ternary/quaternary continuous- band heterostructures,” Proc. of Conference on Laser and Fiber-Optical Networks Modeling, LFNM’06, June 29 –July 1, 2006, Kharkov, Ukraine, pp. 399-402.
17. I.M. Safonov, I.A. Sukhoivanov, M.V. Klymenko, and O.V. Shulika, “Novel Approach for Design of Low-loss DBRs for VCSELs,” accepted to Frontiers in Optics. 90th OSA Annual Meeting
18. M.V. Klymenko, I.M. Safonov, A.V. Shulika, and I.A. Sukhoivanov, “Effective-mass superlattice,” 7th International Young Scientists Conference “Optics and High Technology Material Science” SPO 2006, 26-29 October 2006, Kyiv, Ukraine.
19. M.V. Klymenko, I.M. Safonov, A.V. Shulika, and I.A. Sukhoivanov, “LaserCADIII simulator,“ 7th International Young Scientists Conference “Optics and High Technology Material Science” SPO 2006, 26-29 October 2006, Kyiv, Ukraine.
20. М.В. Клименко, И.С. Петров, И.М. Сафонов и др. «Применение сверх решетки без разрывов зон для эффективной инжекции электронов в квантово-каскадных структурах», VI Харківська конференция молодих науковців «Радіофізика та електроніка», 13-14 грудня, 2006, НАН ІРЕ, Харків, Україна

2007

21. Клименко М.В. и Петров С.И. «Электроны в сверхрешетке с непрерывной зоной проводимости» // Вестник Харьковского национального университета им. В.Н. Каразина – 2007 - №756, №11 - С. 91-96
22. M.V. Klymenko, I.M. Safonov, O.V. Shulika, I.A. Sukhoivanov, “Effective-mass superlattice as an injector in quantum cascade lasers,” Tech. digest of the PHASE international workshop „PHysics and Applications of SEmiconductor Lasers,“ March 28-30, 2007, Supeléc, Campus de Metz, France, p.31.
23. M.V. Klymenko, I.M. Safonov, I.A. Sukhoivanov, “Impact of position-dependent effective mass on injector transmittivity in the quantum-cascade laser,” International Workshop on Optoelectronic Physics and Technology, OPT 2007, 20-22 June 2007, Kharkiv, Ukraine, pp. 7-8
24. M.V. Klymenko “Efficient gain computation for semiconductor quantum-wells,” International Workshop on Optoelectronic Physics and Technology, OPT 2007, 20-22 June 2007, Kharkiv, Ukraine, pp. 52-53
25. M.V. Klymenko, I.M. Safonov, I.A. Sukhoivanov, R. Michalzik “Effective-mass superlattice as a ballistic transport element,” International Workshop on Optoelectronic Physics and Technology, OPT 2007, 20-22 June 2007, Kharkiv, Ukraine, pp. 5-6
26. M.V. Klymenko, I.M. Safonov, O.V. Shulika “Education and simulation with LaserCADIII,” International Workshop on Optoelectronic Physics and Technology, OPT 2007, 20-22 June 2007, Kharkiv, Ukraine, pp. 32-33

2008

27. M.V. Klymenko, I.M. Safonov, O.V. Shulika, I.A. Sukhoivanov and R. Michalzik «Effective-mass superlattice as an injector in quantum cascade lasers,» Optics and quantum electronics, v. 40, No 2-4, March 2008, pp. 197-204
28. M.V. Klymenko, I.M. Safonov, O.V. Shulika and I.A. Sukhoivanov and R. Michalzik «Ballistic transport in semiconductor superlattices with non-zero in-plane wave vector,» Phisica Status Solidi B., v. 245, No 8, 2008, pp. 1598-1603

ABSTRACTS OF JOURNALS PAPERS

1. Gain spectra computation for semiconductor structures with single quantum well/ M.V. Klimenko, A.V. Shulika, I.M. Safonov, I.A. Sukhoivanov// Radioelektronika i informatika. 2005 № 03

New approach to the band structure computation for the single quantum well structure is proposed. It is based on the Galerkin method as in many papers. Novelty is contained in basis functions that have been computed with the transfer matrix method.

2. Influence of the axial approximation on density of states of the quantum-size structures / M.V. Klimenko, A.V. Shulika, I.M. Safonov, I.A. Sukhoivanov, // Radiotechnika: All-Urk. Sci. Interdep. Mag. 2005.

In this paper the influence of the axial approximation on spectral characteristics is investigated. The investigation is based on band structure computation using kp-method with the envelope function approximation. Such investigation is carried out for QW structures with and without application of the axial approximation. It is shown that the axial approximation leads to high inaccuracy as compared with bulk semiconductors.

3. Electrons in superlattice with continuous conduction band edge / M.V. Klimenko, S.I. Petrov, // Vestnik Karazin KhNU. 2007.

In this paper, the energy spectrum of electrons is investigated for the superlattice with continuous conduction band edge. The comparison with conventional superlattice has been realized. It is shown that in the investigated structure the energy spectrum has band structure which is caused by periodic position-dependent effective-mass. Moreover, position-dependent effective-mass leads to additional effective potential. The Bragg reflection for electrons in ballistic limit can be observed in the superlattice with continuous conduction band edge. It can be used for effective Bragg confinement of carriers. For the first time the investigations have been carried out for the case when the superlattice without band offsets has finite number of periods. The obtained results shed light on new applications of the investigated structures for THz frequency range.