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SESSIONS LOCATION

Monday, October 4, 2021

TIME (MSK)	CONFERENCE HALL	AUDITORIUM A	AUDITORIUM B
15.00 – 16.20	Hi-Tech Companies Presentations	----------	----------

Tuesday, October 5, 2021

9.20. Conference Hall. WELCOME REMARKS

TIME (MSK)	CONFERENCE HALL	AUDITORIUM A	AUDITORIUM B
9.20 – 11.00	**Plenary Session I.** Emerging Devices	----------	----------
11.30 – 13.30	**Plenary Session II**. Quantum Informatics I	Session 1. Beyond CMOS Devices	Session 2. Advances in Electron Beam Lithography
14.30 – 16.20	Session 3. Memory: Structures & Devices I	Session 4. BEOL Materials & Processes I	Session 5 Quantum Informatics II
16.40 – 18.40	Session 6. Memory: Structures & Devices II	Session 7. BEOL Materials & Processes II	Session 8. Quantum Informatics III

Wednesday, October 6, 2021

TIME (MSK)	CONFERENCE HALL	AUDITORIUM A	AUDITORIUM B
9.00 – 11.00	**Plenary Session III** Emerging Materials	----------	----------
11.20 – 13.10	Session 9. THz Devices I	Session 10. Optoelectronic Materials & Devices	Session 11. Quantum Informatics IV
14.20 –16.00	Session 12. THz Devices II	Session 13. Ultrathin Films Growth	Session 14. Quantum Informatics V

TIME (MSK)	HALL
16.20 – 18.40	POSTER SESSION I

Thursday, October 7, 2021

TIME (MSK)	CONFERENCE HALL	AUDITORIUM A	AUDITORIUM B
9.00 – 10.40	Session 15. Superconducting Effects & Devices	Session 16. Plasma Processing & Diagnostics	Session 17. Quantum Informatics VI
11.00 - 12.50	Session 18. Device Modeling & Simulation	Session 19. Magnetic Materials & Structures	Session 20. Quantum Informatics VII
14.00 – 15.40	Session 21. MEMS Technologies & Devices	Session 22. Microelectronic Metrology	Session 23. Quantum Informatics VIII

TIME (MSK)	HALL
16.00 – 18.20	POSTER SESSION II

16.00. ROUND TABLE. The origins and prospects of microelectronics in Russia: to the 90th anniversary of academician K.A. Valiev.

18.30. Conference Hall. CLOSING CONFERENCE REMARKS

ICMNE-2021 SCIENTIFIC PROGRAM

Please note that:

- **Moscow time is used everywhere below**

Oral Sessions

Monday, October 4, 2021

9.00 Registration & Accommodation
13.00-14.00 Lunch

Conference Hall
Special Session. Presentations of Hi-Tech Companies (in Russian)

Session Chairman: Andrey Miakonkikh, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

15.00 S1-01 Application of the time-of-flight mass spectrometry and direct chemical mapping in modern microelectronic. *D. Shepel* (online). *Technoinfo Ltd., Moscow, Russia; Semenov Institute of Chemical Physics of RAS, Moscow, Russia*.

15.30 S1-02 STEM applications for imaging and analysis of the materials at the atomic level. *A. Bondarenko* (online). *Technoinfo Ltd., Moscow, Russia*.

17.00 Welcome Party
19.00 Dinner

8.20 Breakfast

Conference Hall

9.20 WELCOME REMARKS

V.F. Lukichev, Program Committee Co-Chair, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia***.**

Plenary Session I. Emerging Devices

Session Chairman: Vladimir Lukichev, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

9.30 L1-01 KEYNOTE: Nanoelectronic devices for the ultimate integration of ICs with high performance and very low power consumption. *F. Balestra* (online). *University of Grenoble Alpes, CNRS, Grenoble INP, IMEP-LAHC, Grenoble, France.*

10.00 L1-02 KEYNOTE: SoC edge node devices combining SOI CMOS and sensors. *Y. Roizin* (online). *Tower Semiconductor, Inc., Migdal HaEmek , Israel.*

10.30 L1-03 INVITED: Advanced Modeling of Emerging MRAM: From Finite Element Methods to Machine Learning Approaches. *J. Ender[1,2], S. Fiorentini[1], R.L. de Orio[2], T. Hadámek[1], M. Bendra[1,2], W. Goes[3], S. Selberherr[2], V. Sverdlov[1,2].* *1. Christian Doppler Laboratory for Nonvolatile Magnetoresistive Memory and Logic at the Institute for Microelectronics, TU Wien, Vienna, Austria. 2. Institute for Microelectronics, TU Wien, Vienna, Austria. 3. Silvaco Europe, Cambridge, United Kingdom.*

11.00-11.20 Coffee break

Conference Hall
Plenary Session II. Quantum Informatics I

Session Chairman: Yuri Bogdanov, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

11.30 qL1-01 INVITED: Ion-based quantum computations: from single- to muli-qubit systems. *N. Kolachevsky* (online). *P.N. Lebedev Physical Institute of RAS, Moscow, Russia.*

12.00 qL1-02 INVITED: Towards quantum computation and simulations with single rubidium Rydberg atoms in an array of optical dipole traps. *I.I. Ryabtsev[1,2]* (online), *I.I. Beterov[1,2], E.A. Yakshina[1,2], D.B. Tretyakov[1,2], V.M. Entin[1,2], N.V. Alyanova[2], K.Yu. Mityanin[2], I.N. Ashkarin[1,2], K.-L. Pham[3], S. Lepoutre[3], P. Pillet[3], P. Cheinet[3].* *1. Rzhanov Institute of Semiconductor Physics of SB RAS, Novosibirsk, Russia. 2. Novosibirsk State University, Novosibirsk, Russia. 3. Laboratoire Aime Cotton, CNRS, Univ. Paris-Sud, Universite Paris-Saclay, Orsay, France.*

12.30 qL1-03 INVITED: Quantum Technologies: State of Art and Prospects. *S. Kulik[1,2].* *1. Chair of Quantum Electronics, Faculty of Physics, M.V. Lomonosov State University, Moscow, Russia. 2. Quantum Technology Centre of MSU, Moscow, Russia.*

13.00 qL1-04 **INVITED: Many-spin entanglement in multiple quantum NMR in simple spin models.** ***S. Doronin[1], I. Lazarev [1,2], E. Fel'dman[1]*** **(online).** *1. Institute of Problems of Chemical Physics of RAS, Chernogolovka, Russia. 2. Faculty of Fundamental Physical-Chemical Engineering, Lomonosov Moscow State University, Moscow, Russia.*

Auditorium A
Session 1. Beyond CMOS Devices

Session Chairman: Vladimir Vyurkov, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

11.30 O1-01 **Quantum design of interference transistors based on resonance coalescence effect.** ***N.M. Shubin[1,2,3], A.A. Gorbatsevich[1,2,3], G.Ya. Krasnikov[3].*** *1. P.N. Lebedev Physical Institute of RAS, Moscow, Russia. 2. National Research University of Electronic Technology, Zelenograd, Russia. 3. JSC Molecular Electronics Research Institute, Zelenograd, Russia.*

11.50 O1-02 **Single-electron single-atom transistor based on arsenic dopants in silicon.** ***M.A. Kolpakov, S.A. Dagesyan, D.E. Presnov, V.V. Shorokhov, V.A. Krupenin, O.V. Snigirev.*** *Faculty of Physics, Moscow State University, Moscow, Russia.*

12.10 O1-03 **Investigation of electron transport in nanostructures based on metal-organic frameworks.** ***S.A. Pankratov[1,2] (online), I.V. Bozhev[1,2], V.V. Shorokhov[1,2], V.A. Krupenin[1,2], P.O. Mikhailov[1,2], I.O. Salimova[3], E.K. Beloglazkina[3], D.E. Presnov[1,2,4].*** *1. Faculty of Physics, Moscow State University, Moscow, Russia. 2. MSU Quantum Technology Centre, Moscow, Russia. 3. Faculty of Chemistry, Moscow State University, Moscow, Russia. 4. Nuclear Physics Institute, Moscow State University, Moscow, Russia.*

12.30 O1-04 ~~**Tristate Transistors: Base Parameters and Impurities Distribution.** ***S. Krivelevich.*** *Yaroslavl Branch of the Valiev Institute of Physics and Technology of RAS, Yaroslavl, Russia.*~~ (**recalled**)

Auditorium B
Session 2. Advances in Electron Beam Lithography

Session Chairman: Konstantin Rudenko, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

11.30 O1-05 **INVITED: Optical device fabrication technology with advanced electron beam lithography systems.** ***M. Shibata*** **(online).** *CRESTEC CORPORATION, Tokyo, Japan.*

12.00 O1-06 **Comprehensive simulation of thermally amplified e-beam lithography.** ***F. Sidorov, A. Rogozhin, E. Zhikharev.*** *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

12.20 O1-07 **Investigation of plasma resistance of the HSQ electronic resist for prototyping of nanoelectronic devices.** ***A. Miakonkikh[1], A. Shishlyannikov[2], A. Tatarintsev[1], V. Kuzmenko[1], K. Rudenko[1], E. Gornev[2].*** *1. Valiev Physics and Technology Institute of RAS, Moscow, Russia. 2. JSC Molecular Electronics Research Institute, Moscow, Russia.*

12.40 O1-08 **Electron beam lithography on the surface with 3D relief.** ***A. Miakonkikh,*** ***A. Tatarintsev*** **(online),** ***K. Rudenko.*** *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

13.30-14.30 Lunch

Conference Hall
Session 3. Memory: Structures & Devices I

Session Chairman: Konstantin Rudenko, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

14.30 O1-09 **KEYNOTE: Stochastic effects in memristors: Theory and applications.** ***Y.V. Pershin*** **(online).** *Department of Physics and Astronomy, University of South Carolina, Columbia, South Carolina, USA.*

15.00 O1-10 **Light sensitive memristors based on $GeSi_xO_y$ films with Ge nanoclusters.** ***V.A. Volodin*** [1,2]***, G.N. Kamaev*** [1,2]***, I.D. Yushkov*** [1,2]***, G.K. Krivyakin*** [1,2]***, S.G. Cherkova*** [1]***, M. Vergnat*** [3]**.** *1. Rzhanov Institute of Semiconductor Physics of SB RAS, Novosibirsk, Russia. 2. Novosibirsk State University, Novosibirsk, Russia. 3. Université de Lorraine, CNRS, IJL, Nancy, France.*

15.20 O1-11 **Investigation of conductive filament growth and rupture in ReRAM structures based on hafnium oxide.** ***E. Ganykina*** [1,2] **(online),** ***A. Rezvanov*** [1]***, Ye. Gornev*** [1]**.** *1. JSC Molecular Electronics Research Institute. Zelenograd, Russia. 2. Moscow Institute of Physics and Technology, Dolgoprudny, Russia.*

15.40 O1-12 **Repetitive nonlinear behaviour during RESET process in bipolar resistive switching of $Al_2O_3/HfO_2/TaO_XN_Y$ stack.** ***O. Permiakova,*** ***A. Rogozhin, E. Smirnova, K. Rudenko.*** *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

16.00 O1-13 **Investigation of the defect distribution in multilayer dielectric stacks for ReRAM application using C-AFM technique.** ***A. Isaev*** [2]***, A. Rogozhin*** [1]***, E. Smirnova*** [1]***, K. Rudenko*** [1]**.** *1. Valiev Institute of Physics and Technology of RAS, Moscow, Russia. 2. Moscow Institute of Physics and Technology, Dolgoprudny, Russia.*

Auditorium A
Session 4. BEOL Materials & Processes I

Session Chairman: Alexander Rogozhin, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

14.30 O1-14 **INVITED: Materials for on-chip interconnects: challenges and solutions.** ***M.R. Baklanov[1,2]*** **(online).** *1. North China University of Technology, Beijing, P. R. China. 2. MIREA – Russian Technological University, Moscow, Russia*.

15.00 O1-15 **Evolution of low-k films properties near critical curing temperature.** ***A.S. Vishnevskiy[1]*** **(online),** ***D.S. Seregin[1], G.A. Orlov[1], V.A. Storonkin[1], I.S. Ovchinnikov[1], K.A. Vorotilov[1], M.R. Baklanov[1,2].*** *1. MIREA – Russian Technological University (RTU MIREA), Moscow, Russia. 2. North China University of Technology (NCUT), Beijing, P. R. China*.

15.20 O1-16 **Post-processing hydrophobization of microporous low-k films.** ***D.A. Vorotyntsev*** **(online),** ***A.S. Vishnevskiy, D.S. Seregin, K.A. Vorotilov.*** *MIREA – Russian Technological University (RTU MIREA), Moscow, Russia*.

15.40 O1-17 **Effect of precursors hydrolysis conditions on structure and properties of benzene bridged organosilica glass films.** ***G.A. Orlov*** **(online),** ***A.S. Vishnevskiy, D.S. Seregin, K.A. Vorotilov.*** *MIREA – Russian Technological University (RTU MIREA), Moscow, Russia*.

16.00 O1-18 **Spin-on deposition of low-k films: Effect of solvent.** ***M.V. Selivanov, A.S. Vishnevskiy, D.S. Seregin, K.A. Vorotilov.*** *MIREA – Russian Technological University (RTU MIREA), Moscow, Russia*.

Auditorium B
Session 5. Quantum Informatics II

Session Chairman: Sergey Kulik, *M.V. Lomonosov Moscow State University, Moscow, Russia.*

14.30 q1-01 ~~**INVITED: Symmetries and Entanglement in Quantum Networks.** ***P. Vojta, D. Solenov*** **(online).** *Department of Physics, St. Louis University, St. Louis, Missouri, USA*.~~ (recalled)

15.00 q1-02 **Collective qubits on double quantum dots with Coulomb interaction.** ***A. Levin[2], L. Fedichkin[1,2], V. Vyurkov[1,2].*** *1. Valiev Institute of Physics and Technology of RAS, Moscow, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia*. **(previously scheduled as q2-02)**

15.30 q1-03 **Descriptional Complexity of Unitary Transformations.** ***A. Kaltchenko*** **(online).** *Wilfrid Laurier University, Waterloo, Canada*.

15.50 q1-04 **Quantum error reduction with deep neural network applied at the post-processing stage.** ***A.A. Zhukov[1], W.V. Pogosow[1,2].*** *1. Dukhov Research Institute of Automatics (VNIIA), Moscow, Russia. 2. Institute for Theoretical and Applied Electrodynamics of RAS, Moscow, Russia*. **(previously scheduled as q2-08)**

16.20-16.40 Coffee break

Conference Hall
Session 6. Memory: Structures & Devices II

Session Chairman: Konstantin Rudenko, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia*

16.40 O1-19 **Modeling the characteristics of memristors based on low-dimensional materials.** ***F. Meshchaninov*[1,2] (online), *D. Zhevnenko*[1,2], *V. Kozhevnikov*[1,2], *E. Shamin*[1,2], *E. Gornev*[1,2].** *1. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia. 2. JCS Molecular Electronics Research Institute, Zelenograd, Russia.*

17.00 O1-20 **Impact of built-in fields dynamics and switching kinetics of polarization on the retention loss in FRAM based on thin $Hf_{0.5}Zr_{0.5}O_2$ films.** ***E.V. Kondratyuk, V.V. Mikheev, D.V. Negrov, A.A. Chouprik.*** *Moscow Institute of Physics and Technology, Dolgoprudny, Russia.*

17.20 O1-21 **Development of biocompatible flexible ferroelectric field effect transistor based on thin hafnium oxide films.** ***V.V. Mikheev, A.A. Chouprik, E.V. Kondratyuk, E.V. Korostylev, E.A. Guberna, G. Margolin, D.V. Negrov.*** *Moscow Institute of Physics and Technology, Dolgoprudny, Russia.*

17.40 O1-22 **Impact of Temperature on Single Event Upset in SRAM Cells with Technology Node Scaling.** ***D. Popov, D. Silkin, A. Sultanov, A. Mukhametdinova, B. Gallyamov.*** *National Research University Higher School of Economics (Moscow Institute of Electronics and Mathematics), Moscow, Russia.*

18.00 O1-23 ~~**Raman scattering of structural modifications in $Ge_2Sb_2Te_5$ thin films during thermal crystallization: in-situ Raman scattering study.** ***V. Glukhenkaya, A. Romashkin, A. Yakubov, P.I. Lazarenko, M. Fedyanina, A.A. Sherchenkov.*** *National Research University of Electronic Technology, Moscow, Russia.*~~ (**recalled**)

Auditorium A
Session 7. BEOL Materials & Processes II

Session Chairman: Andrey Miakonkikh, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

16.40 O1-24 **Methylated porous low-k materials: critical properties and plasma resistance.** ***A.A Rezvanov*[1,2], *A.V. Miakonkikh*[3], *A.S. Vishnevskiy*[4], *D.S. Seregin*[4], *K.A. Vorotilov*[4], *K.V. Rudenko*[4], *M.R. Baklanov*[3,5].** *1. Moscow Institute of Physics and Technology, Dolgoprudny, Russia. 2. JSC Molecular Electronics Research Institute, Zelenograd, Russia. 3. Valiev Institute of Physics and Technology of RAS, Moscow, Russia. 4. Research and Education Center "Technological Center", Moscow, RTU MIREA – Russian Technological University, Russia. 5. Department of Microelectronics, North China University of Technology, Beijing, People's Republic of China.*

17.00 O1-25 **Study of electrodynamic parameters of the low-k thin films in the THz-IR ranges.** ***A. Gavdush* (online), *G. Komandin.*** *Prokhorov General Physics Institute of RAS, Moscow, Russia.*

17.20 O1-26 Development and characterization of processes for atomic layer deposition of ruthenium films. ***E. Smirnova, V. Kuzmenko, A. Miakonkikh, A. Rogozhin.*** *Valiev Institute of Physics and Technology of RAS, Moscow, Russia*.

17.40 O1-27 Cobalt for advanced interconnects. ***A. Rogozhin[1], A. Miakonkikh[1], E. Severov[2], K. Rudenko[1].*** *1. Valiev Institute of Physics and Technology of RAS, Moscow, Russia. 2. Moscow Institute of Physics and Technology, Dolgoprudny, Russia.*

18.00 O1-28 Towards the problem of IC reliability: instability of the shape of the boundary of adjoining conductive films under the action of electric current and mechanical stresses. ***T. Makhviladze*** **(online),** ***M. Sarychev.*** *Valiev Institute of Physics and Technology of RAS, Moscow, Russia*.

Auditorium B
Session 8. Quantum Informatics III

Session Chairman: Leonid Fedichkin, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia***.**

16.40 q1-05 Elements of satellite quantum network. ***V.L. Kurochkin[1,3,4], A.V. Khmelev[1,2,3], V.F. Mayboroda[3,4], R.M. Bakhshaliev[3,4], A.V. Duplinsky[3], Y.V. Kurochkin[1,2,3,4].*** *1. Russian Quantum Center, Skolkovo, Russia. 2. Moscow Institute of Physics and Technology (National Research University), Dolgoprudny, Russia. 3. QRate, Moscow, Russia. 4. NTI Center for Quantum Communications, National University of Science and Technology MISiS, Moscow, Russia*.

17.00 q1-06 Estimating performance of quantum processor individual components based on an available data. ***Ya. Zolotarev[1,2]*** **(online),** ***I. Luchnikov[1,2], J. López-Saldívar[1,2], A. Fedorov[1,2], E. Kiktenko[1,2,3].*** *1. Russian Quantum Center, Skolkovo, Moscow, Russia. 2. Moscow Institute of Physics and Technology, Dolgoprudny, Russia. 3. Department of Mathematical Methods for Quantum Technologies, Steklov Mathematical Institute of RAS, Moscow, Russia*.

17.20 q1-08 Quantum tomography of multi-level quantum systems. ***B.I. Bantysh, Yu.I. Bogdanov.*** *Valiev Institute of Physics and Technology of RAS, Moscow, Russia*.

17.40 q1-07 Quantum circuits simulation with Multi-scale Entanglement Renormalization Ansatz. ***I.A. Luchnikov[1,2], A.V. Berezutskii[1,3]*** **(online),** ***A.K. Fedorov[1,2].*** *1. Russian Quantum Center, Skolkovo, Moscow, Russia. 2. Moscow Institute of Physics and Technology, Dolgoprudny, Russia. 3. Institut quantique & Département de physique, Université de Sherbrooke, Québec, Canada*.

18.00 q1-09 Quantum measurements, complete information matrix and high-precision control of quantum states. ***Yu.I. Bogdanov.*** *Valiev Institute of Physics and Technology of RAS, Moscow, Russia*.

18.20 q1-10 Quantum memory on multi atom-resonator system. ***S.A. Moiseev[1]*** **(online),** ***A.M.Zheltikov[1,2,3,4].*** *1. Kazan Quantum Center, Kazan National Research Technical University n.a. A.N.Tupolev-KAI, Kazan, Russia. 2. M.V. Lomonosov Moscow State University, Moscow, Russia. 3. Texas A&M University, College Station, Texas, USA. 4. Russian Quantum Center, Skolkovo, Russia*.

19.00 Dinner

8.15 Breakfast

Conference Hall
Plenary Session III. Emerging Materials

Session Chairman: Vladimir Lukichev, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

9.00 L2-01 **INVITED: Emerging 2D Ferromagnetism in Silicene, Germanene and Graphene Compounds at the Monolayer Limit and beyond.** ***D.V. Averyanov, A.M. Tokmachev, O.E. Parfenov, I.A. Karateev, I.S. Sokolov, A.N. Taldenkov, V.G. Storchak.*** *National Research Center "Kurchatov Institute", Moscow, Russia.*

9.30 L2-02 **INVITED: Multilayer semiconductor-dielectric nanostructures as the base for neuromorphic, photonic, and RF ICs.** ***V.P. Popov[1], M.S. Tarkov[1], I.E. Tyschenko[1], K.V. Rudenko[2], A.V. Miakonkikh[2].*** *1. Rzhanov Institute of Semiconductor Physics of SB RAS, Novosibirsk, Russia. 2. Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

10.00 L2-03 **INVITED: Efficient computation of EM scattering from a dielectric cylinder covered with graphene strips.** ***B. Guizal[1]*** **(online),** ***Y. Jeyar[1], M. Antezza[1,2].*** *1. Laboratoire Charles Coulomb (L2C), CNRS-Université de Montpellier, Montpellier, France. 2. Institut Universitaire de France, Paris Cedex, France.*

10.30 L2-04 **INVITED: Wafer-scale deposition of Graphene and 2D Materials for the Optoelectronic Industry: (PE) CVD, (PE) ALD & ALE.** ***T. Miller*** **(online),** ***F. Reale, D. Stanton, H. Knoops, R.S. Sundaram, O. Thomas.*** *Oxford Instruments Plasma Technology, Yatton, UK.*

11.00 - 11.20 Coffee break

Conference Hall
Session 9. THz Devices I

Session Chairman: Vladimir Vyurkov, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

11.20 O2-01 **KEYNOTE: Controlling the PT symmetry of graphene Dirac plasmons and its application to terahertz laser transistors.** ***T. Otsuji[1]*** **(online),** ***A. Satou[1], V. Ryzhii[1], H. Fukidome[1], M. Ryzhii[2], K. Narahara[3].*** *1. Research Inst. of Electrical Communication, Tohoku University, Sendai. Japan. 2. Department of Computer Science and Technology, University of Aizu, Aizu-Wakamatsu, Japan. 3. Department of Electrical and Electronic Engineering, Kanagawa Institute of Technology, Atsugi, Japan.*

11.50 O2-02 **INVITED: UTC-PD-Integrated HEMT Double-Mixer for Optical to MMW/THz Carrier Frequency Down-Conversion.** ***A. Satou[1,3]*** **(online),** ***D. Nakajima[1,3], K. Nishimura[1,3], T. Hosotani[1,3], T. Suemitsu[2,3], K. Iwatsuki[3], T. Otsuji[1,3].*** *1. Research Institute of Electrical Communication, Tohoku University, Sendai, Japan. 2. Center for Innovative Integrated Electronic Systems, Tohoku University, Sendai, Japan. 3. Research Organization of Electrical Communication, Tohoku University, Sendai, Japan.*

12.20 O2-03 **Novel designs and materials in THz quantum cascade lasers.** ***D. Ushakov[1], A. Afonenko[1], O.Yu. Volkov[2], I.N. Dyuzhikov[2], V.V. Pavlovskiy[2], A. Dolgov[3], R. Galiev[3], S. Pushkarev[3], D. Ponomarev[3], R. Khabibullin[3]*** **(online).** *1. Belarusian State University, Minsk, Belarus. 2. Kotelnikov Institute of Radio-Engineering and Electronics of RAS, Moscow, Russia. 3. V.G. Mokerov Institute of Ultra-High Frequency Semiconductor Electronics of RAS, Moscow, Russia.*

12.40 O2-04 **Strain-induced THz detectors for spectroscopic and imaging applications.** ***D. Lavrukhin[1], A. Yachmenev[1], Yu. Goncharov[2], K. Zaytsev[2], R. Khabibullin[1], D. Ponomarev[1,2]*** **(online).** *1. V.G. Mokerov Institute of Ultra-High Frequency Semiconductor Electronics of RAS, Moscow, Russia. 2. Prokhorov General Physics Institute of RAS, Moscow, Russia.*

Auditorium A
Session 10. Optoelectronic Materials & Devices

Session Chairman: Konstantin Rudenko, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

11.20 O2-05 **Novel III-V semiconductor heterostructures for functionally integrated devices.** ***T.A. Bagaev[1]*** **(online),** ***M.A. Ladugin[1], A.A. Padalitsa[1], A.A. Marmalyuk[1], Yu.V. Kurnyavko[1], A.V. Lobintsov[1], A.I. Danilov[1], S.M. Sapozhnikov[1], V.V. Krichevskii[1], V.P. Konyaev[1], V.A. Simakov[1], S.O. Slipchenko[2], A.A. Podoskin[2], N.A. Pikhtin[2].*** *1. Stel'makh Research and Development Institute "Polyus", Moscow, Russia. 2. Ioffe Institute of RAS,, St. Petersburg, Russia.*

11.50 O2-06 **Picosecond infrared laser crystallization of Ge layers in Ge/Si multi-nanolayers for optoelectronic applications.** ***V.A. Volodin[1,2], G.K. Krivyakin[1,2], A.V. Bulgakov[3,4], Y. Levy[3], J. Beránek[3], S. Nagisetty[3], N.M. Bulgakova[3], P.V. Geydt[2], A.A. Popov[5].*** *1. Rzhanov Institute of Semiconductor Physics of SB RAS, Novosibirsk, Russia. 2. Novosibirsk State University, Novosibirsk, Russia. 3. HiLASE Centre, Institute of Physics AS CR, Dolní Břežany, Czech Republic. 4. Kutateladze Institute of Thermophysics of SB RAS, Novosibirsk, Russia. 5. Yaroslavl Branch of the Valiev Institute of Physics and Technology of RAS, Yaroslavl, Russia.*

12.10 O2-07 **Aluminum doped thermomigrated silicon channels for high voltage solar cell: structure and electrical properties.** ***A. Lomov[1], B. Seredin[2], S. Martyushov[3], I. Gavrus[2].*** *1. Valiev Institute of Physics and Technology of RAS, Moscow, Russia. 2. Platov South-Russian State Polytechnic University, Novocherkassk, Russia. 3. Technological Institute for Superhard and Novel Carbon Materials, Troitsk, Russia.*

12.30 O2-08 **Prospects for the use of composite materials in optoelectronic devices.** ***R. Galutin*** **(online),** ***P. Razzchivalov.*** *Institute of Nano – MicroSystem Technology, National University of Electronic Technology (MIET), Zelenograd, Russia.*

12.50 O2-09 **Improving the convergence of numerical methods for solving Maxwell's equations by processing edge singularities of the electromagnetic field.** ***I.A. Semenikhin.*** *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

Auditorium B
Session 11. Quantum Informatics IV

Session Chairmen: Boris Bantysh, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia*.

11.20 **q2-01** **Optimal linear-optical generation of entangled two-qubit states.** ***S.A. Fldzhyan, M.Yu. Saygin, S.P. Kulik.*** *Quantum Technology Centre, M.V. Lomonosov Moscow State University, Moscow, Russia*.

11.50 **q2-02** **New number is q1-02**.

11.50 **q2-03** **Super resolution of two point sources by means of spatial mode transformation and photon statistics analysis.** ***K.G. Katamadze[1,2], B.I. Bantysh[2], D.O. Akatiev[3], N.A. Borshchevskaya[1], E.V. Kovlakov[1], Yu.I. Bogdanov[2], S.P. Kulik[1].*** *1. M.V. Lomonosov Moscow State University, Moscow, Russia. 2. Institute of Physics and Technology of RAS, Moscow, Russia. 3. Federal State Budgetary Institution of Science Federal Research Center Kazan Scientific Center of RAS, Kazan, Russia*.

12.10 **q2-04** **Variational simulation of Schwinger's Hamiltonian with polarization qubits.** ***O.V. Borzenkova[1], G.I. Struchalin[2], A.S. Kardashin[1], V.V. Krasnikov[2], N.N. Skryabin[2], S.S. Straupe[2], S.P. Kulik[2], J.D. Biamonte[1].*** *1. Skolkovo Institute of Science and Technology, Russia. 2. Quantum Technology Centre and Faculty of Physics, M.V. Lomonosov Moscow State University, Moscow, Russia*.

12.30 **q2-05** **Education setup for quantum optics and quantum information tasks.** ***N. Borshchevskaia[1]*** **(online),** ***K. Katamadze[1,2], E. Mareev[1], F. Potemkin[1], B. Bantysh[1,2], G. Avosopiants[1,2], Yu. Vladimirova[1], S. Kulik[1].*** *1. M.V. Lomonosov Moscow State University, Moscow, Russia. 2. Institute of Physics and Technology of RAS, Moscow, Russia*.

13.10-14.10 Lunch

Conference Hall
Session 12. THz Devices II

Session Chairman: Konstantin Rudenko, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia*.

14.20 O2-10 **Design of a distributed compensation of a narrow gap capacitance for a THz transit-time generator.** ***N. Simonov, V. Vyurkov, K. Rudenko, V. Lukichev.*** *Valiev Institute of Physics and Technology of RAS, Moscow, Russia*.

14.40 O2-14 **Investigations of the transmission and reflection spectra of THz radiation of magnetic metallic nanowires.** ***L.A. Fomin[1], V.G. Krishtop[1], E.N. Zhukova[2,5], D.L. Zagorsky[3], I.M. Doludenko[3], S.G. Chigarev[4], E.A. Vilkov[4].*** *1. Institute of Microelectronic Technology of RAS, Chernogolovka, Russia. 2. Moscow Institute of Physics and Technology, Dolgoprudny, Russia. 3. Federal Research Center "Crystallography and Photonics" of RAS, Moscow, Russia. 4. Fryazino Branch of the Kotelnikov Institute of Radio Engineering and Electronics of RAS, Fryazino, Russia. 5. A.M. Prokhorov Institute of General Physics, RAS, Moscow, Russia*.

15.00 O2-12 **Power enhancement of THz generation based on transit-time diodes with varying injection.** ***I. Semenikhin[1], N. Simonov[1], A.V. Borzdov[2], V.M. Borzdov[2], V. Vyurkov[1], K. Rudenko[1], V. Lukichev[1].*** *1. Valiev Institute of Physics and Technology of RAS, Moscow, Russia. 2. Belarusian State University, Minsk, Belarus.*

15.20 O2-13 **Effects of the peak current and valley current of the current-voltage curve in self-excitation and amplification processes in GaAs/AlAs THz resonant tunneling nanostructures.** ***A.A. Aleksanyan[1], A.L. Karuzskii[1]*** **(online),** ***Yu.A. Mityagin[1], A.V. Perestoronin[1], N.A. Volchkov[1], A.P. Chernyaev[2].*** *1. P. N. Lebedev Physical Institute of RAS, Moscow, Russia. 2. Institute of Physics and Technology (State University), Dolgoprudny, Russia*.

15.40 O2-11 **Ultra-sensitive terahertz detection with tunnel field-effect transistors.** ***D. Svintsov[1]*** **(online),** ***D. Bandurin[2], I. Gayduchenko[3], G. Alymov[1], A. Geim[2], G. Fedorov[1].*** *1. Moscow Institute of Physics and Technology, Dolgoprudny, Russia. 2. School of Physics, University of Manchester, Manchester, UK. 3. Moscow Pedagogical State University, Moscow, Russia*.

Auditorium A
Session 13. Ultrathin Films Growth

Session Chairman: Andrey Miakonkikh, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

14.20 O2-15 **Competing mechanisms of strain relaxation in Ge/Si(001) heteroepitaxy.** ***O.S. Trushin.*** *Yaroslavl Branch of the Valiev Institute of Physics and Technology of RAS, Yaroslavl, Russia*.

14.40 O2-16 **Re-orientation of graphoepitaxial fluorite films towards small-index crystallographic planes.** ***P.B. Mozhaev[1]*** **(online),** ***I.K. Bdikin[2], J.B. Hansen[3], C.S. Jacobsen[3].*** *1. Valiev Institute of Physics and Technology of RAS, Moscow, Russia. 2. TEMA-NRD, Mechanical Engineering Department and Aveiro Institute of Nanotechnology (AIN), University of Aveiro, Aveiro, Portugal. 3. Department of Physics, Quantum Physics and Information Technology, Technical University of Denmark, Kongens Lyngby, Denmark.*

15.00 O2-17 Magnetron deposition of MoS_2 ultrathin films. ***A.I. Belikov, A.I. Syomochkin, K.Z. Phyo, V.N. Kalinin.*** *Bauman Moscow State Technical University (BMSTU), Moscow, Russia.*

15.20 O2-18 AFM study of the MoS_2 thin films growth initial stage. ***A.I. Belikov, K.Z. Phyo, M.M. Guk.*** *Bauman Moscow State Technical University (BMSTU), Moscow, Russia.*

15.40 O2-19 Atomic layer deposition of thin films of hafnium oxide using Izofaz TM 200-01 system. ***S. Zyuzin*[1,2] (online), Ya. Zasseev*[3], *A. Rezvanov*[1], *V. Panin*[3], *V. Gvozdev*[1], *Ye. Gornev*[1].** *1. JSC Molecular Electronics Research Institute. Zelenograd, Russia. 2. Moscow Institute of Physics and Technology, Dolgoprudny, Russia. 3. JSC Research Institute of Precision Machine Manufacturing, Zelenograd, Russia.*

Auditorium B
Session 14. Quantum Informatics V

Session Chairman: Mikhail Saygin, *Quantum Technology Centre, M.V. Lomonosov Moscow State University, Moscow, Russia.*

14.20 q2-06 Some properties of maximal trace measure of quantum computer error rate. ***L.E. Fedichkin*[1], *A.A. Kurkin*[2].** *1. Valiev Institute of Physics and Technology of RAS, Moscow, Russia. 2. Moscow Institute of Physics and Technology, Dolgoprudny, Russia.*

14.40 q2-07 On the way to a scalable Yb ion quantum computer. ***I. Semerikov*[1], *I. Zalivako*[1], *A. Borisenko*[1], *M. Aksenov*[1], *A. Korolkov*[1,2], *N. Kolachevsky*[1,2], *K. Khabarova*[1,2].** *1. P.N. Lebedev Physical Institute of RAS, Moscow, Russia. 2. Russian Quantum Center, Moscow, Russia.*

15.00 q2-08 Probing non-Markovian quantum dynamics with data-driven analysis. ***I.A. Luchnikov*[1,2,3], *E.O. Kiktenko*[1,3,4], *M.A. Gavreev*[1,3], *H. Ouerdane*[2], *S.N. Filippov*[3,4,5], *A.K. Fedorov*[1,3] (online).** *1. Russian Quantum Center, Skolkovo, Moscow, Russia. 2. Skolkovo Institute of Science and Technology, Moscow, Russia. 3. Moscow Institute of Physics and Technology, Dolgoprudny, Russia. 4. Steklov Mathematical Institute of RAS, Moscow, Russia. 5. Valiev Institute of Physics and Technology of RAS, Moscow, Russia.* **(previously scheduled as q1-04)**

15.20 q2-09 A quantum algorithm for calculation of π on non-ideal quantum computers. ***G.A. Bochkin* (online), *S.I.Doronin, E.B. Fel'dman, A.I. Zenchuk.*** *Institute of Problems of Chemical Physics of RAS, Chernogolovka, Russia.*

15.40 q2-10 Sequences of selective rotation operators for three group clustering on qutrits by means quantum annealing. ***V. Zobov, I. Pichkovskiy* (online).** *Kirensky Institute of Physics, Federal Research Center KSC SB RAS, Krasnoyarsk, Russia.*

16.00-16.20 Coffee break

16.20-18.40 POSTER SESSION I

19.00 Dinner

08.15 Breakfast

Conference Hall
Session 15. Superconducting Effects & Devices

Session Chairman: Vladimir Lukichev, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

9.00 O3-01 **Qubit measurement based on a nonlinear quantum Josephson oscillator.** ***D.S. Pashin*[1], *M.V. Bastrakova*[1], *A.M. Satanin*[2], *C.S. Kim*[3].** *1. National Research Lobachevsky State University of Nizhny Novgorod, Nizhny Novgorod, Russia. 2. Dukhov All-Russian Research Institute of Automation, Moscow, Russia. 3. Department of Physics, Chonnam National University, Gwangju, Korea.*

9.20 O3-02 **Towards receiving wide-band superconductor antenna unit technology.** ***N. Kolotinskiy*[1,2], *D. Bazulin*[3], *V. Kornev*[1].** *1. Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia. 2. Quantum Technology Centre, Lomonosov Moscow State University, Moscow, Russia. 3. Former affiliation: Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia.*

9.40 O3-03 **Phase-locking phenomenon in series Josephson junction arrays with capacitive coupling.** ***A.Yu. Levochkina*[1] (online), *V.K. Kornev*[1], *N.V. Kolotinskiy*[1,2].** *1. Department of Physics, Lomonosov Moscow State University, Russia. 2. Quantum Technology Centre, Department of Physics, Lomonosov Moscow State University, Russia.*

10.00 O3-04 **Dynamic processes in a superconducting adiabatic neuron with non-shunted Josephson contacts**. ***M. Bastrakova*[1], *A. Gorchavkina*[1,2], *A. Schegolev*[3,4], *N. Klenov*[3,4], *I. Soloviev*[3,5], *A. Satanin*[2,5], *M. Tereshonok*[4].** *1. Lobachevsky State University of Nizhny Novgorod, Nizhny Novgorod, Russia. 2. Russia National Research University Higher School of Economics, Moscow, Russia. 3. Lomonosov Moscow State University, Moscow, Russia. 4. Moscow Technical University of Communication and Informatics, Moscow, Russia. 5. Dukhov All-Russia Research Institute of Automatics, Moscow, Russia.*

10.20 O3-05 **Aharonov-Bohm effect as a hylic phenomenon.** ***V. Rubaev*[1], *L. Fedichkin*[2].** *1. NIX, Moscow, Russia. 2. Valiev Institute of Physics and Technology of, RAS, Moscow, Russia.*

Auditorium A
Session 16. Plasma Processing & Diagnostics

Session Chairman: Konstantin Rudenko, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

9.00 O3-06 ~~**On the features of various gas mixing regimes in CF_4(C_4F_8)+O_2+Ar plasmas.** ***A. Efremov*[1] (online), *D. Bashmakova*[1], *D. Travkina*[1], *K. H. Kwon*[2].** *1. Ivanovo State University of Chemistry & Technology, Ivanovo, Russia. 2. Korea University, Sejong, South Korea.*~~ **(recalled)**

9.00 O3-07 Low-energy etching of W and Mo films in halogen-containing plasma in continuous and atomic-layer etching mode. ***I.I. Amirov, M.O. Izyumov, A.N. Kupriyanov.*** *Yaroslavl Branch of the Valiev Institute of Physics and Technology of RAS, Yaroslavl, Russia.*

9.20 O3-08 Study of inductively coupled plasma of fluorobromocarbons by Langmuir probe and optical emission spectroscopy. ***V.O. Kuzmenko, A.V. Miakonkikh, K.V. Rudenko.*** *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

9.40 O3-09 $C_2F_4Br_2$ plasma etching of nanoporous low-k dielectrics. ***A. Miakonkikh[1], V. Kuzmenko[1], A. Vishnevsky[2], A. Rezvanov[3], A. Orlov[3], K. Rudenko[1].*** *1. Valiev Institute of Physics and Technology of RAS, Moscow, Russia. 2. Research and Education Center "Technological Center," RTU MIREA, Moscow Russia. 3. JSC Molecular Electronics Research Institute, Moscow, Russia.*

10.00 O3-10 ~~On the applicability of low-GWP $C_6F_{12}O$ gas plasma for the reactive-ion etching of Si and SiO_2.~~ ***~~A. Efremov[1]~~*** **~~(online),~~** ***~~K.-H. Kwon[2].~~*** *~~1. Ivanovo State University of Chemistry & Technology, Ivanovo, Russia. 2. Korea University, Sejong, South Korea.~~* **(recalled)**

Auditorium B
Session 17. Quantum Informatics VI

Session Chairman: Vladimir Vyurkov, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

9.00 q3-01 Bifurcations and catastrophes at the boundaries separating the phases of quantum correlations. ***M.A. Yurischev*** **(online).** *Institute of Problems of Chemical Physics of RAS, Chernogolovka, Russia.*

9.20 q3-02 On the control of the spread of quantum information in multiple quantum NMR spectroscopy of solids. ***V.E. Zobov[1]*** **(online),** ***A.A. Lundin[2].*** *1. Kirensky Institute of Physics, Federal Research Center KSC SB RAS, Krasnoyarsk, Russia. 2. Semenov Institute of Chemical Physics of RAS, Moscow, Russia.*

9.40 q3-03 Ideal transfer of zero-order coherence matrix and quantum state restoring. ***E.B. Fel'dman[1], A.N. Pechen[2,3], A.I. Zenchuk[1]*** **(online).** *1. Institute of Problems of Chemical Physics of RAS, Chernogolovka, Russia. 2. Department of Mathematical Methods for Quantum Technologies, Steklov Mathematical Institute of RAS, Moscow, Russia. 3. National University of Science and Technology "MISIS", Moscow, Russia.*

10.00 q3-04 Investigations of multiple quantum NMR dynamics of spin dimer on a quantum computer. ***S.I. Doronin, E.I. Kuznetsova*** **(online),** ***E.B. Fel'dman, A.I. Zenchuk.*** *Institute of Problems of Chemical Physics of RAS, Chernogolovka, Russia.*

10.20 q3-05 Determination of Wigner-Yanase skew information with multiple quantum NMR in solids. ***S.I. Doronin[1], E.B. Fel'dman[1], I.D. Lazarev[1,2]*** **(online).** *1. Institute of Problems of Chemical Physics of RAS, Chernogolovka, Russia. 2. Faculty of Fundamental Physical-Chemical Engineering, Lomonosov Moscow State University, Moscow, Russia.*

10.40-11.00 Coffee break

Conference Hall
Session 18. Device Modeling & Simulation

Session Chairman: Vladimir Vyurkov, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

11.00 O3-11 **INVITED: Biomimicry-gradient-based algorithm as applied to the inverse design of photonic devices. *K. Edee* (online), *G. Granet, P. Bonnet, F. Paladian.*** *Institut Pascal, CNRS, Clermont-Ferrand, France.*

11.30 O3-12 **Simulation of Various Nanoelectronic Devices Based on 2D Materials. *I. Abramov, V. Labunov, N. Kalameitsava, I. Romanova, I. Shcherbakova.*** *Belarusian State University of Informatics and Radioelectronics, Minsk, Belarus.*

11.50 O3-13 **Accounting for the body effect in the compact modeling of an "extrinsic" MOSFET drain current in the linear and saturation regimes. *V. Turin*[1] (online), *R. Shkarlat*[2], *V. Poyarkov*[2], *O. Kshensky*[2], *G. Zebrev*[3], *B. Iñiguez*[4], *M. Shur*[5].** *1. Orel State University after Ivan Turgenev, Orel, Russia. 2. JSC "Bolkhov Plant of Semiconductor Devices", Bolkhov, Russia. 3. National Research Nuclear University "MEPHI", Moscow, Russia. 4. Rovira i Virgili University, Tarragona, Spain. 5. Rensselaer Polytechnic Institute, Troy, NY, USA.*

12.10 O3-14 **Program for modeling of semiconductors devices characteristics for SPICE simulation of integrated circuits. *M. Vidanov, O. Mikhailov, I. Gainullin.*** *Physical Faculty of the Lomonosov Moscow State University, Moscow, Russia.*

12.30 O3-15 **The influence of charge carrier quantum transport and isoenergy surface anisotropy on the high-frequency conductivity of a semiconductor nanolayer. *O.V. Savenko* (online), *I.A. Kuznetsova.*** *P.G. Demidov Yaroslavl State University, Yaroslavl, Russia.*

Auditorium A
Session 19. Magnetic Materials & Structures

Session Chairman: Andrey Miakonkikh, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia*

11.00 O3-16 **Magnetic properties and hyperfine interactions of iron-borate single crystals and nanoparticles. *M. Chuev.*** *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

11.20 O3-17 **Control of the magnetic properties of metal oxide nanowires by electromagnetic field. *K. Tsysar* (online), *D.I. Bazhanov, E. Smelova.*** *Lomonosov Moscow State University, Moscow, Russia.*

11.40 O3-18 **Nanostructuring at oblique angle deposition. *O.S. Trushin*[1], *A.A. Popov*[1], *A.N. Pestova*[1], *L.A. Mazaletsky*[1], *A.A. Akulov*[2], *A.A. Lomov*[3].** *1. Yaroslavl Branch of the Valiev Institute of Physics and Technology of RAS, Yaroslavl, Russia. 2. P.G. Demidov Yaroslavl State University, Yaroslav, Russia, 3. Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

12.00 O3-19 **Development of the four probes method for express diagnostics of unpatterned spin tunnel structures. *O.S. Trushin*[1], *A.N. Pestova*[1] (online).** *Yaroslavl Branch of the Valiev Institute of Physics and Technology of RAS, Yaroslavl, Russia.*

Auditorium B
Session 20. Quantum Informatics VII

Session Chairman: Andrey Chernyavskiy, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia*.

11.00 q3-06 Quantum Hashing on the High-dimensional States. ***F. Ablayev[1,2], A. Vasiliev[1,2]*** **(online).** *1. Kazan Federal University, Kazan, Russian Federation. 2. Kazan E.K. Zavoisky Physical-Technical Institute of the Kazan Scientific Center of RAS, Kazan, Russia*.

11.20 q3-07 Quantum assisted unsupervised data clustering on the basis of neural networks. ***I.D. Lazarev[1,2], M. Narozniak[3,4], T. Byrnes[3,4,5,6,7], A.N. Pyrkov[1]*** **(online).** *1. Institute of Problems of Chemical Physics of RAS, Chernogolovka, Russia. 2. Faculty of Fundamental Physical-Chemical Engineering, Lomonosov Moscow State University, Moscow, Russia. 3. New York University Shanghai, Pudong, Shanghai, China. 4. Department of Physics, New York University, New York, NY, USA. 5. State Key Laboratory of Precision Spectroscopy, School of Physical and Material Sciences, East China Normal University, Shanghai, China. 6. NYU-ECNU Institute of Physics at NYU Shanghai, Shanghai, China. 7. National Institute of Informatics, Chiyoda-ku, Tokyo, Japan*.

11.40 q3-08 Quantum Version of Self-Balanced Binary Search Tree with Strings as Keys and Applications. ***K. Khadiev[1], S. Enikeeva[2].*** *1. Kazan Federal University, Kazan, Russia; Zavoisky Physical-Technical Institute, FRC Kazan Scientific Center of RAS, Kazan, Russia. 2. Kazan Federal University, Kazan, Russia*.

12.00 q3-09 Quantum Algorithm for the Shortest Superstring Problem. ***K. Khadiev[1]*** **(online),** ***C.M.B. Machado[2].*** *1. Kazan Federal University, Kazan, Russia; Zavoisky Physical-Technical Institute, FRC Kazan Scientific Center of RAS, Kazan, Russia. 2. Kazan Federal University, Kazan, Russia*.

12.30 q3-10 The Quantum Version of Prediction for Binary Classification Problem by Ensemble Methods. ***K. Khadiev, L. Safina.*** *Kazan Federal University, Kazan, Russia*.

13.00-14.00 Lunch

Conference Hall
Session 20. MEMS Technologies & Devices

Session Chairman: Ildar Amirov, *Yaroslavl Branch of the Valiev Institute of Physics and Technology of RAS, Yaroslavl, Russia*.

14.00 O3-20 Fabrication of Si structures with extremely angled sidewalls by the modified Bosch process in a controlled manner. ***O.V. Morozov, S.V. Kurbatov.*** *Yaroslavl Branch of the Institute of Physics and Technology of RAS, Yaroslavl, Russia*.

14.20 O3-21 Development and research of a micromechanical accelerometer sensitive element. ***V.V. Kalugin[1], L.R. Boev[1,2]*** **(online),** ***E.S. Kochurina[1,2], S.A. Anchutin[1,2], A.S. Timoshenkov[1,2].*** *1. National Research University of Electronic Technology, Zelenograd, Russia. 2. LMD Ltd., Zelenograd, Russia*.

14.40 O3-22 **RF MEMS switch with double-clamp and wafer level package with through silicon vias for integration RF MEMS in applications 5G and Internet of Things.** ***A. Tkachenko, I. Lysenko.*** *Southern Federal University, Design Center of the Microelectronic Component Base for Artificial Intelligence Systems, Taganrog, Russia.*

15.00 O3-23 **Reliability issues for electrostatically actuated MEMS switch.** ***I.V. Uvarov, M.O. Izyumov, I.I. Amirov.*** *Yaroslavl Branch of the Valiev Institute of Physics and Technology of RAS, Yaroslavl, Russia.*

15.20 O3-24 **A fast membrane actuator in the current stabilization regime.** ***I.V. Uvarov[1], A.E. Melenev[2], V.B. Svetovoy[3].*** *1. Yaroslavl Branch of the Valiev Institute of Physics and Technology of RAS, Yaroslavl, Russia. 2. Research and Production Center "Research Institute for Microdevices", Zelenograd, Russia. 3. A.N. Frumkin Institute of Physical Chemistry and Electrochemistry of RAS, Moscow, Russia.*

Auditorium A
Session 22. Microelectronic Metrology

Session Chairman: Andrey Miakonkikh, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

14.00 O3-25 **Analysis of digital elevation models of silicon wafers and wafer-based structures.** ***A. Dedkova[1], I. Florinsky[2], N. Djuzhev[1].*** *1. National Research University of Electronic Technology (MIET), Zelenograd, Russia. 2. Institute of Mathematical Problems of Biology, Keldysh Institute of Applied Mathematics of RAS, Pushchino, Russia.*

14.20 O3-26 **Monolayer and submonolayer films properties investigation using X-ray photoelectron spectroscopy.** ***V. Afanas'ev, L. Lobanova, D. Selyakov*** **(online),** ***M. Semenov-Shefov.*** *National Research University «Moscow Power Engineering Institute», Moscow, Russia.*

14.40 O3-27 **Modification of Bounded J-Ramp Method to monitor reliability and charge degradation of gate dielectric of MIS devices.** ***D.V. Andreev[1]*** **(online),** ***V.M. Maslovsky[2], V.V. Andreev[1], A.A. Stolyarov[1].*** *1. Kaluga Branch of the Bauman Moscow State Technical University, Kaluga, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia.*

15.00 O3-28 **Research methodic of the field transistors high frequency parameters using network analyzer.** ***T. Krupkina[1], V. Losev[1], A. Khlybov[1], D. Rodionov[1], E. Kotlyarov[2], P. Timoshenkov[1].*** *1. National Research University of Electronic Technology (MIET), Zelenograd, Russia. 2. JSC Molecular Electronics Research Institute (MERI), Zelenograd, Russia.*

15.20 O3-29 **Calibration of step height standards in sub-micrometer range using three-dimensional reconstruction method in a scanning electron microscope.** ***V.B. Mityukhlyaev, V.G. Maslov.*** *Center for Surface and Vacuum Research (NICPV), Moscow, Russia.*

15.40 O3-30 ~~**Regularities of interaction of a silicon surface in a fluoroform medium.** ***A. Efremov, D. Murin, S. Pivovarenok, D. Sitanov, A. Malyugin, A. Bobylev.*** *Ivanovo State University of Chemistry & Technology, Ivanovo, Russia*~~. **(recalled)**

Auditorium B
Session 23. Quantum Informatics VIII

Session Chairmen: Konstantin Katamadze, *Valiev Institute of Physics and Technology of RAS, Moscow, Russia*.

14.00 **q3-11** **Study of the effect of quantum noise on the accuracy of the Schrödinger equation simulation on a quantum computer using the Zalka-Wiesner method.** ***N.A. Bogdanova, Yu.I. Bogdanov, D.V. Fastovets, V.F. Lukichev.*** *Valiev Institute of Physics and Technology of RAS, Moscow, Russia*.

14.20 **q3-12** **Software for analysis and comparison of quantum tomography methods.** ***B.I. Bantysh, A.Yu. Chernyavskiy, D.V. Fastovets, Yu.I. Bogdanov.*** *Valiev Institute of Physics and Technology of RAS, Moscow, Russia*.

14.40 **q3-13** **Study of decoherence of a superposition of macroscopic quantum states by means the consideration of a multimode state of a Schrödinger cat.** ***D.V. Fastovets, Yu.I. Bogdanov, N.A. Bogdanova, V.F. Lukichev.*** *Valiev Institute of Physics and Technology of RAS, Moscow, Russia*.

15.00 **q3-14** **Linear optical circuits characterization with thermal states of light.** ***G.V. Avosopiants[1], K.G. Katamadze[1,2], A.V. Romanova[1], Yu.I. Bogdanov[2], S.P. Kulik[1].*** *1. Quantum Technology Centre, Faculty of Physics, M.V. Lomonosov Moscow State University, Moscow,Russia. 2. Valiev Institute of Physics and Technology of RAS, Moscow, Russia*.

15.20 **q3-15** **High-fidelity tracking of the evolution of multilevel quantum states.** ***N.A. Bogdanova, Yu.I. Bogdanov, Yu.A. Kuznetsov, V.F. Lukichev.*** *Valiev Institute of Physics and Technology of RAS, Moscow, Russia*.

15.40-16.00 Coffee break

16.00-18.20 POSTER SESSION II

16.00 ROUND TABLE. The origins and prospects of microelectronics in Russia: to the 90th anniversary of academician K.A. Valiev

18.30. Conference Hall. CLOSING CONFERENCE REMARKS

V.F. Lukichev, Program Committee Chair,
Valiev Institute of Physics and Technology of RAS, Moscow, Russia

19.30 CONFERENCE DINNER

Friday, October 8, 2021

09.00 Breakfast

10.00 DEPARTURE

ICMNE-2021 SCIENTIFIC PROGRAM

POSTER SESSIONS

Wednesday, October 6, 2021

16.20 – 18.40 Poster session I

Memory: Devices, Materials, Technologies

P1-01 **Study of inert gas pressure influence on electroforming and resistive switching of TiN-TiO_2-SiO_2-W memristors.** ***E.S. Gorlachev, V.M. Mordvintsev, S.E. Kudryavtsev.*** *Yaroslavl Branch of the Valiev Institute of Physics and Technology of RAS, Yaroslavl, Russia*.

P1-02 **Effect of electrodes material on the I-V-curve and switching of memristors on the base of electroformed open metal-SiO_2-metal sandwich structure.** ***S.E.Kudryavtsev, V.M. Mordvintsev, V.V. Naumov, E.S. Gorlachev.*** *Yaroslavl Branch of the Valiev Institute of Physics and Technology of RAS, Yaroslavl, Russia*.

P1-03 **Memristor Effect in Electrolyte–Insulator–Semiconductor Structure.** ***A.E. Berdnikov, A.A. Popov.*** *Yaroslavl Branch of the Valiev Institute of Physics and Technology of RAS, Yaroslavl, Russia*.

P1-04 **Influence of the kind of metal on memristor effect in MIS structures.** ***O.M. Orlov[1], A.A. Popov[2], A.A. Stepanov[1], P.S. Sattarov[1].*** *1. JSC Molecular Electronics Research Institute, Zelenograd, Russia. 2. Yaroslavl Branch of the Valiev Institute of Physics and Technology of RAS, Yaroslavl, Russia*.

P1-05 **Analysis and comparison of methods for extracting parameters of compact memristor models.** ***D. Zhevnenko[1,2], F. Meshchaninov[1,2], V. Kozhevnikov[1,2], E. Shamin[1,2], E. Gornev[1,2].*** *1. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia. 2. JCS Molecular Electronics Research Institute, Zelenograd, Russia*.

P1-06 ~~**On memristive properties of vanadium oxide.** ***D. Khakhulin[1], Z. Vakulov[2], R. Tominov[3], V. Smirnov[3], O. Ageev[4].*** *1. Research Laboratory of Functional Nanomaterials Technology, Southern Federal University, Taganrog, Russia. 2. Federal Research Centre The Southern Scientific Centre of RAS, Rostov-on-Don, Russia. 3. Institute of Nanotechnologies, Southern Federal University, Taganrog, Russia. 4. Research and Education Centre 'Nanotechnologies', Southern Federal University, Taganrog, Russia*~~. (**recalled**)

P1-07 ~~**On uniformity of PLD-grown films.** ***D. Khakhulin[1], Z. Vakulov[2], O. Ageev[3].*** *1. Research Laboratory of Functional Nanomaterials Technology, Southern Federal University, Taganrog, Russia. 2. Federal Research Centre The Southern Scientific Centre of RAS, Rostov-on-Don, Russia. 3. Research and Education Centre 'Nanotechnologies', Southern Federal University, Taganrog, Russia*~~. (**recalled**)

P1-08 **Formation of nanocrystalline $BaTiO_3$ thin films by pulsed laser deposition.** ***Z. Vakulov[1], K. Korzun[2], R. Tominov[3], V.A. Smirnov[3], O.A. Ageev[3].*** *1. Federal Research Centre The Southern Scientific Centre of RAS, Russia. 2. Eindhoven University of Technology, Eindhoven, Netherlands. 3. Research and Education Center "Nanotechnology" of Southern Federal University, Russia*.

P1-09 ~~**Reasons for the weak manifestation of the field effect in metal-$Ba_{1-x}Sr_xTiO_3$-Si structures.** ***D.A. Belorusov, E.I. Goldman, G.V. Chucheva.*** *Fryazino Branch of the Kotelnikov Institute of Radioengineering and Electronics of RAS, Fryazino, Russia*.~~ (**recalled**)

P1-10 ~~**The temperature dependence of the local piezoresponse and the surface potential in the $Ba_{1-x}Sr_xTiO_3$ ferroelectric thin film.** ***D.A. Kiselev[1,2], M.S. Afanasiev[1], G.V. Chucheva[1].*** *1. Fryazino branch of the Kotel'nikov Institute of Radioengineering and Electronics of RAS, Fryazino, Russia. 2. National University of Science and Technology "MISiS", Moscow, Russia*.~~ (**recalled**)

P1-11 ~~**Chemical solution deposition of $BiFeO_3$ films with layer-by-layer control of the coverage and composition.** ***V. Safina[1], A. Abramov[1], A. Sobol[2], V. Slabov[3], L. Trusov[2], A. Vasiliev[2], V. Shur[1], A. Kholkin[1,3], D. Alikin[1].*** *1. School of Natural Sciences and Mathematics, Ural Federal University, Yekaterinburg, Russia. 2. Faculty of Chemistry, Lomonosov Moscow State University, Moscow, Russia. 3. Department of Physics & CICECO-Aveiro Institute of Materials, University of Aveiro, Aveiro, Portugal*.~~ (**recalled**)

P1-12 **Specific of magneto-optical response of nanostructures with various shapes and sizes for magnetic memory elaboration.** ***A.V. Prokaznikov[1], V.A. Paporkov[2], V.A. Chirikov[2].*** *1. Yaroslavl Branch of the Valiev Institute of Physics and Technology of RAS, Yaroslavl, Russia. 2. Yaroslavl Demidov State University, Yaroslavl, Russia*.

Sensors and MEMS: Devices, Materials, Technologies

P1-13 **Nanoscale field sensor with adjustable operating temperature for biosensor applications.** ***A.A. Skorik[1,2], I.V. Bozhev[1,2], I.I. Tsiniaikin[1,2], G.V. Presnova[3], M.Yu. Rubtsova[3], V.A. Krupenin[1,2], D.E. Presnov[1,2,4].*** *1. Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia. 2. MSU Quantum Technology Centre, Moscow, Russia. 3. Faculty of Chemistry, Lomonosov Moscow State University, Moscow, Russia. 4. Nuclear Physics Institute, Lomonosov Moscow State University, Moscow, Russia*.

P1-14 **Features of the formation of highly sensitive nanoscale films SnO_2 doped with platinum for sensing applications.** ***K.A. Tsarik, V.A. Petukhov, N.S. Struchkov.*** *National Research University of Electronic Technology, Zelenograd, Russia*.

P1-15 **Nanochannels based on graphene formed by ion etching to develop array-based gas sensors.** ***A.V. Lashkov, N.V. Yakunina, A.V. Romashkin, K.A. Tsarik.*** *National Research University of Electronic Technology, Zelenograd, Russia*.

P1-16 **Spray-coated carbon nanotube network onto metal microwires to form selective gas-sensitive structures with fast response to ammonia.** ***A.V. Romashkin, D.D. Levin, E.V. Alexandrov, V.K. Nevolin.*** *National Research University of Electronic Technology, Zelenograd, Russia*.

P1-17 **Gate-controlled sensing of ammonia by single-layer MoS_2 field effect transistor.** ***N.S. Struchkov[1], N.P. Nekrasov[1], A.V. Emelianov[1], I.I. Bobrinetskii[1,2].*** *1. National Research University of Electronic Technology, Zelenograd, Russia. 2. University of Novi Sad, Novi Sad, Serbia*.

P1-18 **Nonlinear distortions in planar electrochemical transducer.** ***D.A. Zhevnenko*[1,2,3], *E.S. Gornev*[2,3], *P.V. Dudkin*[1,2], *T.V. Krishtop*[1], *V.G. Krishtop*[1,4].** *1. Seismotronics LLC, Moscow, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia. 3. JCS Molecular Electronics Research Institute, Zelenograd, Russia. 4. Institute of Microelectronics Technology and High Purity Materials RAS, Chernogolovka, Russia.*

P1-19 **MEMS Devices based on self-organizing semiconductors structures.** ***M. Denisenko, A. Isaeva, I. Lysenko, A. Tkachenko.*** *Southern Federal University, Taganrog, Russia.*

P1-20 **Designing thermal MEMS on a system level.** ***S. Evstafyev, V. Samoylikov, S. Timoshenkov, P. Gornostaev.*** *National Research University "MIET", Zelenograd, Russia.*

P1-21 **Investigation of the Gas-Phase Deposition of Material Layers for MEMS production processes.** ***V. Samoylikov, S. Timoshenkov, S. Evstafyev.*** *National Research University "MIET", Zelenograd, Russia.*

P1-22 **FEM simulation of AlN-based MEMS energy harvester.** ***P.S. Shlepakov, I.V. Uvarov.*** Yaroslavl Branch of the Valiev Institute of Physics and Technology of RAS, Yaroslavl, Russia.

P1-23 **Nanomechanical resonator based on a silicon nitride nanowire.** ***P.O. Mikhailov*[1,2], *A.A. Dorofeev*[1,2], *A.A. Popov*[1], *S.G. Kafanov*[3], *Yu.A. Pashkin*[3], *A.S. Trifonov*[1,2], *S.A. Pankratov*[1,2], *D.E. Presnov*[1,2,4], *V.A. Krupenin*[1,2].** *1. Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia. 2. MSU Quantum Technology Centre, Moscow, Russia. 3. Department of Physics, Lancaster University, Lancaster, United Kingdom. 4. Nuclear Physics Institute, Lomonosov Moscow State University, Moscow, Russia.*

P1-24 **Research of resonance frequencies of silicon membranes for hydrophone applications.** ***S. Malokhatko*[1,2], *E. Gusev*[1], *O. Ageev*[1,2], *T. Efimov*[3], *E. Rassolov*[3], *R. Romashko*[3].** *1. Southern Federal University, Institute of Nanotechnologies, Electronics and Equipment Engineering, Taganrog, Russia. 2. Research and Education Center "Nanotechnologies" of Southern Federal University, Taganrog, Russia. 3. Optoelectronics Department, Institute of Automation and Control Processes of the Far Eastern Branch of RAS, Vladivostok, Russia.*

Optoelectronic Devices

P1-25 **High-Performance $A^{III}B^{V}$ Photodetector for On-Chip Optical Interconnects.** ***I.V. Pisarenko*[1], *E.A. Ryndin*[1], *B.G. Konoplev*[2].** *1. St. Petersburg Electrotechnical University "LETI", St. Petersburg, Russia. 2. Southern Federal University, Taganrog, Russia.*

P1-26 **Development of nanoantenna array technology for switching in 3-D integrated circuits.** ***D.A. Serov*[1], *I.A. Khorin*[2], *H.V. Pershina*[1], *A.M. Aliev*[1].** *1. RTU MIREA - Russian Technological University, Moscow, Russia. 2. Valiev Instutute of Physics and Technology, Moscow, Russia.*

Radiation Impact on Semiconductor Devices

P1-27 **Long-term irradiation effects in p-MNOS structure: experiment results.** ***E. Mrozovskaya*[1,2], *P. Chubunov*[1,2], *G. Zebrev*[1].** *1. National Research Nuclear University MEPhI, Moscow, Russia. 2. The Branch of JSC URSC – ISDE, Moscow, Russia*.

P1-28 **Influence of hydrogen diffusion and gettering on the radiation hardness of bipolar transistors.** ***E.A. Polushkin*[1,2], *S.V. Nefediev*[2], *A.V. Kovalchuk*[1], *O.A. Soltanovich*[1], *S.Yu. Shapoval*[1].** *1. Institute of Microelectronics Technology and High Purity Materials of RAS, Chernogolovka, Russia. 2. JSC Molecular Electronics Research Institute, Zelenograd, Russia*.

Modeling and Simulation of Semiconductor Devices

P1-29 **Quantum drift-diffusion models for dual-gate field-effect transistors based on mono- and bilayer graphene.** ***I. Abramov, V. Labunov, N. Kalameitsava, I. Romanova, I. Shcherbakova*.** Belarusian State University of Informatics and Radioelectronics, Minsk, Belarus.

P1-30 **Monte Carlo simulation of picosecond laser irradiation photoresponse of deep submicron SOI MOSFET.** ***A.V. Borzdov*[1], *V.M. Borzdov*[1], *V.V. Vyurkov*[2].** *1. Belarusian State University, Minsk, Belarus. 2. Valiev Institute of Physics and Technology of RAS, Moscow, Russia*.

P1-31 **A universal approach to FET compact modeling: Case study for MESFETs and OFETs.** ***D.S. Malich, G.I. Zebrev*.** *National Research Nuclear University MEPHI, Moscow, Russia*.

Other Devices

P1-32 **Modeling the assembly of a microinductor made by using residual mechanical stress.** ***A. Babushkin, R. Selyukov*.** *Yaroslavl Branch of the Valiev Institute of Physics and Technology of RAS, Yaroslavl, Russia*.

P1-33 **Design of multi-electrode microprobe for silicon wet bulk micromachining.** ***E. Gusev*[1], *A. Saryev*[1], *S. Malokhatko*[1,2], *O. Ageev*[1,2].** *1. Southern Federal University, Institute of Nanotechnologies, Electronics and Equipment Engineering, Taganrog, Russia. 2. Research and Education Center "Nanotechnologies" of Southern Federal University, Taganrog, Russia*.

Metrology and Characterization

P1-34 **Beam power absolute measurements using calorimetric methods.** ***V.P. Kudrya*.** *Valiev Institute of Physics and Technology of RAS, Moscow, Russia*.

P1-35 **Application of electron spectroscopy spectra interpretation methods to describe ions spectroscopy signals.** ***V. Afanas'ev, L. Lobanova, D. Selyakov, M. Semenov-Shefov*.** *National Research University «Moscow Power Engineering Institute», Moscow, Russia*.

P1-36 **Uncertainty of a nano- object linewidth value at its control by a low-voltage SEM.** ***Yu. Larionov*[1], *Yu. Ozerin*[2].** *1. A.M. Prokhorov Institute of General Physics, Moscow, Russia. 2. Mikron, Zelenograd, Russia*.

16.00 – 18.20 Poster session II

Materials and Films

P2-01 ~~**Ion synthesis of SOI structures with silicate insulating layers.** ***Ed.Yu. Buchin, Yu.I. Denisenko, S.G. Simakin.*** *Yaroslavl Branch of the Valiev Institute of Physics and Technology of RAS, Yaroslavl, Russia*. (**recalled**)~~

P2-02 ~~**The shape of the relief of the insulating potential, created by ultrathin layers of the oxide.** ***E.I. Goldman, I.A. Shusharin, G.V. Chucheva.*** *Fryazino Branch of the Kotelnikov Institute of Radioengineering and Electronics of RAS, Fryazino, Russia*. (**recalled**)~~

P2-03 ~~**Characterization of mobility in thin films structures.** ***E.G. Zaytseva, O.V. Naumova.*** *Rzhanov Institute of Semiconductor Physics of SB RAS, Novosibirsk, Russia*. (**recalled**)~~

P2-04 **Electron transport in quasi-2D array of As dopants in Silicon.** ***M.A. Kolpakov*[1,2], S.A. Dagesyan[1,2], V.S. Vlasenko[1,2], S.Yu. Ryzhenkova[1,2], V.V. Shorokhov[1,2], D.E. Presnov[1,2,3], V.A. Krupenin[1,2].*** *1. Department of Physics, Moscow State University, Moscow, Russia. 2. MSU Quantum Technology Center, Moscow, Russia. 3. Skobeltsyn Institute of Nuclear Physics, Moscow State University, Moscow, Russia*.

P2-05 **Study of silicon carbide surface at different stages of doping by nitrogen atoms.** ***M.Z. Andalashvili[1], D.E. Presnov[1,2,3], D.K. Minenbaev[1,2], A.E. Rogozin[4], A.V. Miakonkikh[4], A.V. Lubenchenko[5], I.I. Tsiniaikin[1,2], V.A. Krupenin[1,2], A.S. Trifonov[1,2].*** *1. Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia. 2. MSU Quantum Technology Centre, Moscow, Russia. 3. Nuclear Physics Institute, Lomonosov Moscow State University, Moscow, Russia. 4. Valiev Institute of Physics and Technology of RAS, Moscow, Russian. 5. Department of General Physics and Nuclear Fusion, National Research University "Moscow Power Engineering Institute", Moscow, Russia*.

P2-06 **MBE growth of GaAs on modified silicon substrates.** ***M. Eremenko[1], N. Shandyba[1], M. Solodovnik[1], S. Balakirev[1], N. Chernenko[1], O. Ageev[1,2].*** *1. Institute of Nanotechnologies, Electronics and Equipment Engineering, Southern Federal University, Taganrog, Russia. 2. Research and Education Center "Nanotechnologies", Southern Federal University, Taganrog, Russia*.

P2-07 ~~**In-situ MOVPE growth characterization of GaAs-based heterostuctures.** ***N. Volkov.*** *Sigm Plus, Moscow, Russia*. (**recalled**)~~

P2-08 ~~**Strain-compensated AlGaInAs/InP heterostructures for high-power laser diodes.** ***V.N. Svetogorov, Yu.L. Ryaboshtan, M.A. Ladugin, A.A. Marmalyuk.*** *Stelmach Research Institute "Polyus", Moscow, Russia*. (**recalled**)~~

P2-09 **Electrical properties of GaAs-based metal-oxide-semiconductor structures with HfO_2 insulating films.** ***S. Koveshnikov[1], V. Kovalskiy[1], O. Soltanovich[1], M. Dorokhin[2], R. Kriukov[2], A. Zdoroveyshchev[2], B. Zvonkov[2].*** *1. Institute of Microelectronics Technology of RAS, Chernogolovka, Russia. 2. Research Institute of Physics and Technology, Lobachevsky State University, Nizhni Novgorod, Russia*.

P2-10 **Mechanical properties of p-type thermoelectric materials on the basis of Bi-Sb-Te system determined by nanoindentation.** ***A. Yakubov, D. Pepelyaev, D. Murashko, A. Gerasimenko, D. Terekhov, I. Voloshchuk, M. Shtern, A. Sherchenkov.*** *National Research University of Electronic Technology, Zelenograd, Russia.*

P2-11 **Investigation of the thermal properties for n-type thermoelectric materials on the basis of Bi-Se-Te system.** ***Y. Shtern, M. Shtern, A. Sherchenkov, M. Rogachev, D. Pepelyaev, A. Babich.*** *National Research University of Electronic Technology, Zelenograd, Russia.*

P2-12 **Investigation of nanoporous low-k dielectrics by spectral ellipsometry.** ***R. Gaydukasov[1,2], A. Miakonkikh[1].*** *1. Valiev Institute of Physics and Technology of RAS, Moscow, Russia. 2. Moscow Institute of Physics and Technology (State University), Dolgoprudny, Russia.*

P2-13 ~~**Influence of low-energy Ar ion bombardment on the texture and resistivity of Ti films.** ***R. Selyukov[1], M. Izyumov[1], V. Naumov[1], L. Mazaletskiy[2].*** *1. Yaroslavl Branch of the Institute of Physics and Technology of RAS, Yaroslavl, Russia. 2. P.G. Demidov Yaroslavl State University, Yaroslavl, Russia.*~~ (**recalled**)

P2-14 **Investigation of the electrophysical and mechanical properties of metallization based on alloys W with Re, Ti, N for high-temperature silicon ULSI.** ***A. Timakov, V. Shevyakov.*** *National Research University of Electronic Technology, Zelenograd, Russia.*

P2-15 **Investigation of the deposition features and characteristics of diffusion barrier layers of Ti-TiN for metallization in MIS transistor structures with a vertical channel.** ***V.S. Gornostay-Polsky, V.I. Shevyakov.*** *National Research University of Electronic Technology, Zelenogras, Russia.*

P2-16 **Copper filled contact plugs formation.** ***S. Gorokhov[1,2], S. Patyukov[2], V. Plaksin[2].*** *1. Moscow Institute of Physics and Technology, Dolgoprudny, Russia. 2. JSC Molecular Electronics Research Institute, Zelenograd, Russia.*

P2-17 **Structural and magnetic properties of nanostructured Co films fabricated by oblique angle deposition.** ***D.M. Zakharov[1], A.A. Lomov[1], O.S. Trushin[2], L.A. Fomin[3].*** *1. Valiev Institute of Physics and Technology of RAS, Moscow, Russia. 2. Yaroslavl Branch of the Valiev Institute of Physics and Technology of RAS, Yaroslavl, Russia. 3. Institute of Microelectronic Technology and High Purity Materials of RAS, Chernogolovka, Russia.*

P2-18 **Features of the behavior of the resistance of thin Mo films during oxidation and weak antilocalization.** ***V.A. Berezin, I.V. Malikov, L.A. Fomin.*** *Institute of Microelectronic Technology of RAS, Chernogolovka, Russia.*

P2-19 ~~**Formation of graphene structures on the surface of silicon carbide by the plasma ALE method.** ***V.S. Klimin[1, 2], A.A. Rezvan[1], Yu.V. Morozova[1], I.O. Kessler[1], O.A. Ageev[2].*** *1. Southern Federal University, Institute of Nanotechnologies, Electronics, and Equipment Engineering, Department of Nanotechnologies and Microsystems, Taganrog, Russia. 2. Southern Federal University, Research and Education Center "Nanotechnology", Taganrog, Russia.*~~ (**recalled**)

P2-20 **Influence of the duration of the oxygen-containing precursor supply on the carbon concentration during ALD.** ***A. Fadeev[1], A. Miakonkikh[1], S. Simakin[2], E. Smirnova[1], K. Rudenko[1].*** *1. Valiev Institute of Physics and Technology of RAS, Moscow, Russia. 2. Yaroslavl Branch of the Valiev Institute of Physics and Technology of RAS, Yaroslavl, Russia.*

Micro- and Nanoelectronic Technologies

P2-21 **Technology of the thin film flexible thermoelectric generator using low-cost photolithography.** ***A. Terekhov, D. Pepelyaev, A. Sherchenkov.*** *National Research University of Electronic Technology, Zelenograd, Russia.*

P2-22 **3-D printing three-dimensional structures of millimeter size with submicron resolution.** ***E.A. Polushkin, A.V. Kovalchuk, S.Yu. Shapoval.*** *Institute of Microelectronics Technology and High Purity Materials of RAS, Chernogolovka, Russia.*

P2-23 **Investigation of the Au-Assisted Chemical Etching of Silicon for formation of Ethanol fuel cells.** ***O. Volovlikova, G. Silakov.*** *National Research University MIET, Zelenograd, Russia.*

P2-24 ~~**Creation of nanoscale structures on the silicon surface by plasma chemical etching and focused ion beam.** ***V.S. Klimin[1,2], A.A. Rezvan[1], I.O. Kessler[1], Yu.V. Morozova[1], O.A. Ageev[2].*** *1. Southern Federal University, Institute of Nanotechnologies, Electronics, and Equipment Engineering, Department of Nanotechnologies and Microsystems, Taganrog, Russia. 2. Southern Federal University, Research and Education Center "Nanotechnology", Taganrog, Russia.*~~ (**recalled**)

P2-25 **Optimization of OxiEtch process using time-resolved optical emission spectroscopy.** ***V.O. Kuzmenko[1], A.V. Miakonkikh[1], S. Kolar[2], K.V. Rudenko[1].*** *1. Valiev Institute of Physics and Technology of RAS, Moscow, Russia. 2. Moscow Institute of Physics and Technology, Dolgoprudny, Russia.*

P2-26 ~~**Dynamics of trenches formation by moving ribbon ion beam.** ***A.S. Rudy[1], A.N. Kulikov[2], V.I. Bacurin[1], E.A. Kozlov[2].*** *1. Yaroslavl Branch of the Valiev Institute of Physics and Technology of RAS, Yaroslavl, Russia. 2. P.G. Demidov Yaroslavl State University, Yaroslavl, Russia.*~~ (**recalled**)

P2-27 **Investigation of the influence of the parameters of the temporary bonding and thinning operations on the bending of silicon wafers.** ***N. Djuzhev, M. Makhiboroda, E. Gusev, M. Fomichev, A. Dedkova, P. Ivanin.*** *National Research University of Electronic Technology, Zelenograd, Russia.*

P2-28 **Numerical study of aperture shape effects in deep cryogenic etching of silicon.** ***M.K. Rudenko, A.V. Miakonkikh, V.F. Lukichev.*** *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

P2-29 **High temperature sintering of Al_2O_3 sol-gel films for acoustic applications.** ***S. Avdeev[1], D. Ryabova[1], S. Malokhatko[1,2], E. Gusev[1].*** *1. Southern Federal University, Institute of Nanotechnologies, Electronics and Equipment Engineering, Taganrog, Russia. 2. Research and Education Center "Nanotechnologies" of Southern Federal University, Taganrog, Russia.*

P2-30 **Induced bistability effect in the thermal reactor elements for a bistable mode of heat treatment of silicon wafers.** ***V. Ovcharov, V. Prigara.*** *Yaroslavl Branch of the Valiev Institute of Physics and Technology of RAS, Yaroslavl, Russia.*

Quantum Informatics

P2-31 **Graph neural networks for quantum walks analysis.** ***A.A. Melnikov[1], A.P. Deshpande[2], L.E. Fedichkin[1].*** *1. Valiev Institute of Physics and Technology of RAS, Moscow, Russia. 2. Birla Institute of Technology and Science, Pilani, India.*

P2-32 **Quantum entanglement in a family of Heisenberg models with the multiple components of Dzyaloshinsky-Moriya and Kaplan-Shekhtman-Entin-Wohlman-Aharony interactions.** ***A.V. Fedorova, M.A. Yurischev.*** *Institute of Problems of Chemical Physics of RAS, Chernogolovka, Russia.*

P2-33 **The effect of quantum noise on algorithmic perfect quantum state transfer on NISQ superconducting processors.** ***D. Babukhin, W. Pogosov.*** *Dukhov Research Institute of Automatics (VNIIA), Moscow, Russia.*

P2-34 **Broadband biphoton source for quantum optical coherence tomography.** ***A.V. Romanova[1], A.V. Pashchenko[1], K.G. Katamadze[1,2], S.P. Kulik[1].*** *1. M.V. Lomonosov Moscow State University, Moscow, Russia. 2. Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

P2-35 **Measurement of polarization quantum states under chromatic aberration conditions.** ***Yu.I. Bogdanov, B.I. Bantysh, N.A. Bogdanova, M.I. Shakirov, V.F. Lukichev.*** *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

P2-36 **Comparative analysis of various protocols for high-precision tomography of ion-based qudits.** ***Yu.I. Bogdanov, B.I. Bantysh, N.A. Bogdanova, K.B. Koksharov, V.F. Lukichev.*** *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

P2-37 **High-fidelity tomography of fluorescent ion qubits under conditions of limited discrimination between "bright" and "dark" levels.** ***Yu.I. Bogdanov, B.I. Bantysh, N.A. Bogdanova, I.A. Dmitriev, V.F. Lukichev.*** *Valiev Institute of Physics and Technology of RAS, Moscow, Russia.*

P2-38 **Implementation of quantum operations in a transmon qubit by bipolar single-flux-quantum pulse sequence.** ***M. Bastrakova[1], V. Vozhakov[2,3], I. Soloviev[2,3], N. Klenov[2,3], A. Satanin[3,4].*** *1. Lobachevsky State University of Nizhny Novgorod, Nizhny Novgorod, Russia. 2. Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia. 3. Dukhov All-Russia Research Institute of Automatics, Moscow, Russia. 4. Russia National Research University Higher School of Economics, Moscow, Russia.*

P2-39 **Optical quantum memory in a Tm^{3+}:$Y_3Al_5O_{12}$ crystal waveguide.** ***A.V. Pavlov[1], M.M. Minnegaliev[1], K.I. Gerasimov[1], R.V. Urmancheev[1], T.A. Rupasov[1], E.S. Moiseev[1], A.A. Kalinkin[2], S.P. Kulik[2], S.A. Moiseev[1].*** *1. Kazan Quantum Center, A.N. Tupolev Kazan National Research Technical University (KAI), Kazan, Russia. 2. Quantum technology center and Faculty of Physics, M.V. Lomonosov Moscow State University, Moscow, Russia.*

P2-40 ~~**Integrated multiresonator quantum memory.** ***N. Perminov[1,2], S. Moiseev[1,2].*** *1. Kazan Quantum Center, A.N.Tupolev Kazan National Research Technical University (KAI), Kazan, Russia. 2. Zavoisky Physical-Technical Institute, Kazan Scientific Center of RAS, Kazan, Russia.*~~ (**recalled**)

P2-41 **Quantum memory on atomic frequency comb in a plasmon-polariton waveguide.** ***N.M. Arslanov, Yu.A. Kharlamova, S.A. Moiseev.*** *Kazan Quantum Center, Kazan National Research Technical University named after A. N. Tupolev, Kazan, Russia.*

P2-42 **Quantum transistor with multi-qubit memory in an integral waveguide-resonator scheme.** ***Yu.A. Kharlamova*****, *N.M. Arslanov*, *S.N. Andrianov*, *S.A. Moiseev*.** *Kazan Quantum Center, Kazan National Research Technical University named after A. N. Tupolev, Kazan, Russia*.