

TERA - 2018

3rd International Conference
**Terahertz and Microwave Radiation:
Generation, Detection and Applications**

October 22 - 25, 2018

Institute of Applied Physics of the Russian Academy of Sciences
46 Ulyanov Street · 603950 · Nizhny Novgorod · Russia

PROGRAM

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Dear participant of TERA 2018!

We are glad to see you in Nizhny Novgorod!

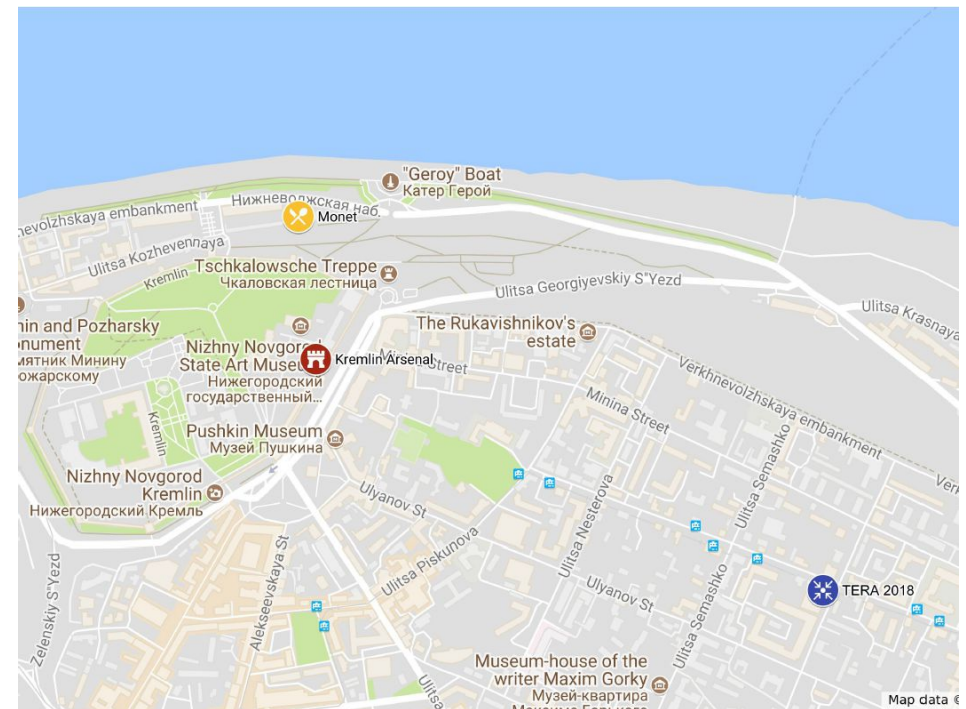
Conference venue information:

The conference will be held at Scientific and Educational Centre of the Institute of Applied Physics RAS: Bol'shaya Pecherskaya str., 31/9.

The registration desk will be organized at the 4th floor of the centre.

Welcome party will be held in the “Kremlin Arsenal” center: Kremlin str., 6.

Conference dinner will be at the “Monet” restaurant: Nizhnevolzhskaya embankment, 1B.



Time	Hall A	Hall B
Monday, October 22		
9:00	Registration starts	
14:00-14:30	OPENING (HALL A)	
14:30-16:00	Plenary session 1	
16:00-16:30	Coffe break	
16:30-18:00	S1.1 Electronic sources of THz & MW radiation, synchrotron radiation, free-electron lasers	S2.1 Optoelectronic & solid-state sources of THz radiation
19:00-21:00	Welcome party	
Tuesday, October 23		
9:00-11:00	Plenary session 2	
11:00-11:30	Coffe break	
11:30-13:30	S1.2 Electronic sources of THz & MW radiation, synchrotron radiation, free-electron lasers	S2.2 Optoelectronic & solid-state sources of THz radiation
13:30-14:30	Lunch	
14:30-16:00	Poster session 1 (Sections S6-S10)	
16:00	Excursion	
Wednesday, October 24		
9:00-11:00	Plenary session 3	
11:00-11:30	Coffe break	
11:30-13:30	S1.3 Electronic sources of THz & MW radiation, synchrotron radiation, free-electron lasers	S4.1 Quantum cascade lasers
13:30-14:30	Lunch	
14:30-16:30	S1.4 Electronic sources of THz & MW radiation, synchrotron radiation, free-electron lasers	S4.2 Quantum cascade lasers
	S7.1 Interaction of high-power THz and MW radiation with matter. Application of THz radiation for the research and control of ultrafast process in physics, chemistry and biology	
16:30-17:00	Coffe break	
17:00-18:30	Poster session 2 (Sections S1-S5)	
20:00	Conference dinner	
Thursday, October 25		
9:00-9:40	Plenary session 4	
09:40-11:10	Special Section "Status of the User Facilities Centers"	S9.1 Systems of security and non-destructive control using THz and MW radiation. Remote sensing with THz radiation. Communication in THz frequency range
11:10-11:40	Coffe break	
11:40-13:30	Special Section "Status of the User Facilities Centers"	S5.1 Detection of THz & MW radiation. Metrology in THz frequency range
13:30-14:30	Lunch	
14:30-16:00	S9.2 Systems of security and non-destructive control using THz and MW radiation. Remote sensing with THz radiation. Communication in THz frequency range	S5.2 Detection of THz & MW radiation. Metrology in THz frequency range
	S8. Terahertz & microwave imaging: tomography, holography and near-field microscopy	
16:00-16:30	CLOSING SESSION (Hall A)	

Hall C	Hall D
Monday, October 22	
S3.1 Generation of THz radiation by intense laser pulses	S10.1 Medical and biological applications of THz radiation
S3.2 Generation of THz radiation by intense laser pulses	S6.1 Study of materials (including nano- and metamaterials) with the help of THz & MW radiation. Time-domain and CW spectroscopy
S3.3 Generation of THz radiation by intense laser pulses	S10.2 Medical and biological applications of THz radiation
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	S6.2 Study of materials (including nano- and metamaterials) with the help of THz & MW radiation. Time-domain and CW spectroscopy
S7.2 Interaction of high-power THz and MW radiation with matter. Application of THz radiation for the research and control of ultrafast process in physics, chemistry and biology	
	S6.3 Study of materials (including nano- and metamaterials) with the help of THz & MW radiation. Time-domain and CW spectroscopy
S7.3 Interaction of high-power THz and MW radiation with matter. Application of THz radiation for the research and control of ultrafast process in physics, chemistry and biology	S6.4 Study of materials (including nano- and metamaterials) with the help of THz & MW radiation. Time-domain and CW spectroscopy

Oral Sessions

	Hall A	Hall B
Monday, October 22		
9:00	Registration starts	
14:00-14:30	OPENING (HALL A)	
14:30-16:00	Plenary session 1	
	Chairman: Mikhail Glyavin	
	Efim Khazanov · <i>Ultra-high-power-lasers Nobel prize 2018 and related research at IAP RAS</i> Gun-Sik Park · <i>Investigations of hydration dynamics in biomedical systems using terahertz waves</i>	
16:00-16:30	Coffe break	
16:30-18:00	S1.1 Electronic sources of THz & MW radiation, synchrotron radiation, free-electron lasers	S2.1 Optoelectronic & solid-state sources of THz radiation
	Chairman: Vladimir Zapevalov	Chairman: Viktor Ustinov
	V. Bratman · <i>Prospective THz gyrotrons for high-field magneto-resonance spectroscopy</i>	V. Gavrilenko · <i>THz stimulated emission at interband transitions in HgTe/CdHgTe quantum wells (invited)</i>
	Y. Tatematsu · <i>Recent progress in development and application of sub-THz gyrotrons in University of Fukui (invited)</i>	N. Kinev · <i>Wideband Josephson THz flux-flow oscillator integrated with the slot lens antenna and the harmonic mixer</i>
	T. Ruess · <i>Towards Fully Automated Systems for the Generation of Very High Order Modes in Oversized Waveguides</i>	A. Klushin · <i>Evidence of synchronization of large Josephson-junction arrays by traveling electromagnetic waves</i>
	O. Dumbrajs · <i>Possible gyrotron operation in the 'no start current' zone</i>	V. Kurin · <i>Active Josephson traveling wave antennae as prospective terahertz oscillators</i>
19:00-21:00	Welcome party	

Hall C	Hall D
S3.1 Generation of THz radiation by intense laser pulses	S10.1 Medical and biological applications of THz radiation
Chairman: Stelios Tzortzakis	Chairman: Gian Piero Gallerano
T. Ozaki · <i>THz nonlinear optics in the sub-cycle regime (keynote)</i>	V. Vaks · <i>High resolution terahertz spectroscopy for medical, biological and agricultural applications (invited)</i>
O. Kosareva · <i>Terahertz generation from single and multiple filaments in air (invited)</i>	K. Zaytsev · <i>Intraoperative diagnosis of malignant brain gliomas using terahertz pulsed spectroscopy and optical coherence tomography (invited)</i>
S. Skupin · <i>Resonant Effects in Terahertz Generation with Laser-Induced Gas Plasmas (invited)</i>	Yu. Kistenev · <i>Applications of THz laser spectroscopy and machine learning for medical diagnostics (invited)</i>
I. Oladyshkin · <i>Role of surface plasmons in laser-induced THz generation from metals</i>	N. Chernomyrdin · <i>Biomedical applications of terahertz solid immersion microscopy</i>
	A. Postnikov · <i>A device to inspect a skin cancer tumour in the terahertz range, transferring the image into the infrared</i>

	Hall A	Hall B
Tuesday, October 23		
9:00-11:00	Plenary session 2	
	Chairman: Alexander Shkurinov	
	Andrew Martusevich <i>Biomedical applications of microwave radiation: innovative approaches</i> Stelios Tzortzakis <i>Extreme THz fields from near and mid-infrared laser filaments</i> Chi Kuang Sun <i>Femtosecond Acoustics and Terahertz Ultrasonics</i>	
11:00-11:30	Coffe break	
11:30-13:30	S1.2 Electronic sources of THz & MW radiation, synchrotron radiation, free-electron lasers	S2.2 Optoelectronic & solid-state sources of THz radiation
	Chairman: Nikolay Vinokurov	Chairman: Gregory Goltsman
	Gun-Sik Park · THz generation from high-Q Fano metallic metamaterial (invited)	V. Ustinov · Molecular beam epitaxial growth of semiconductor heterostructures for THz electronics (keynote)
	A. Pankratov · Thermal regimes and THz generation from BSCCO mesas	V. Shastin · Terahertz lasers based on donor intracenter transitions in silicon (invited)
	A. Arzhannikov · High power THz-range Wave generation based on Transformation of Plasma Waves Pumped by High-current Relativistic Electron Beam	G. Mouret · Frequency comb for THz metrology
	A. Savilov · THz radiation of stabilized dense electron bunches	D. Ponomarev · Plasmonic terahertz antennas with high-aspect ratio metal gratings
	A. Vikharev · Generation of powerful subterahertz superradiance pulses for high gradient acceleration of charged particles	M. Kulygin · Long-Pulsed Modulation Regimes of Subterahertz Nanosecond Waveguide Switches
	A. Doria · Novel Schemes for Compact FELs in the THz Region: ENEA Experience and Perspectives (invited)	
13:30-14:30	Lunch	
14:30-16:00	Poster session 1 (sections S6-S10)	
16:00	Excursion	

Hall C	Hall D
Tuesday, October 23	
S3.2 Generation of THz radiation by intense laser pulses	
Chairman: Olga Kosareva	Chairman: Chi Kuang Sun
A. Shkurinov · Terahertz Wave Generation from Liquefied Gas (invited)	L. Surin · Millimeter-wave spectroscopy of weakly bound molecular complexes and small clusters (invited)
A. Popov · New Approach to Generation and Amplification of the THz Radiation in Plasma Created by Intense Two-Color Laser Fields (invited)	R. Bocquet · Modelisation of a gas phase polarization induced by a 200 GHz chirped pulse (invited)
A. Silaev · Laser-plasma generation of tunable ultrashort pulses in terahertz and mid-infrared ranges	E. Chesnokov · The first observation of the free induction signals of OH radicals in the terahertz region (invited)
S. Stremoukhov · Terahertz radiation in two-color laser fields: from single atom to extended gas response	M. Koshelev · Accurate broadband THz molecular spectroscopy
P. Chizhov · Modulation of two-color laser-induced filament terahertz emission by effective length variation.	T. Odintsova · Far IR continuum absorption of H ₂ ¹⁶ O and H ₂ ¹⁸ O
A. Ushakov · Backward terahertz emission from two-color laser induced plasma spark	M. Koshelev · Recent results on THz gyrotron-based molecular spectroscopy
Lunch	
Poster session 1 (sections S6-S10)	
Excursion	

	Hall A	Hall B
Wednesday, October 24		
9:00-11:00	Plenary session 3	
	Chairman: Manfred Thumm Alessandro Tredicucci · Terahertz quantum cascade lasers: what way forward? Dmitry Khokhlov · Terahertz probing of topological surface electron states (conference sponsors) Steffen Neidhardt , Rohde & Schwarz, · Measurement of radome material for 77/79 GHz automotive radar integration	
11:00-11:30	Coffe break	
11:30-13:30	S1.3 Electronic sources of THz & MW radiation, synchrotron radiation, free-electron lasers	S4.1 Quantum cascade lasers
	Chairman: Olgierd Dumbrajs	Chairman: Alexei Baranov
	N. Ginzburg · Generation of Sub-Terahertz Surface Waves by Relativistic Electron Beams: Quasioptical Theory, Simulations and Experiments	L. Consolino · Metrological-grade THz radiation (invited)
	N. Peskov · Development of powerful long-pulse Bragg FELs operating from sub-THz to THz bands based on linear induction accelerators: recent results and projects	A. Andronov · Bloch and Wannier-Stark THz emissions in superlattices: rival of Quantum Cascade Laser?
	A. Grigoriev · Problems of amplifier klystron advancing into terahertz band	R. Arkhipov · Generation of ultra-short pulses via self-induced transparency mode-locking regime in lasers (invited)
	E. Myasin · Sub-THz orotron with one and two electron beams	A. Babichev · Quantum-cascade lasers of mid-IR spectral range: epitaxy, diagnostics and device characteristics (invited)
	N. Ryskin · Development and modeling of miniaturized traveling-wave tubes in millimeter and sub-THz band	R. Khabibullin · Terahertz quantum cascade laser with silver- and gold-based waveguide (invited)
	L. Revin · $YBa_2Cu_3O_{7-\delta}$ Josephson generators fabricated by preliminary topology masks	Yu. Lobanov · Characterization of the THz QCL Using Fast Superconducting Hot Electron Bolometer
13:30-14:30	Lunch	

Hall C	Hall D
9:00-11:00	
S3.3 Generation of THz radiation by intense laser pulses	
Chairman: Zengxiu Zhao	Chairman: Maxim Nazarov
F. Rotermund · THz nonlinear photonics: generation and applications (invited)	O. Smolyanskaya · Interaction of terahertz radiation with tissue phantoms: numerical and experimental studies (invited)
K. Kawase · Multi wavelength injection-seeded THz parametric system (invited)	A. Polyakova · The mechanism of the effect of microwave radiation on the parameters of homeostasis in living systems
A. Brantov · Laser induced THz Sommerfeld waves along metal wire.	V. Zapevalov · High-power microwaves against locusts and other harmful animals
A. Kuratov · Plasma mechanisms of terahertz electromagnetic wave generation due to intense laser-plasma interaction	S. Peltek · Nonthermal impact of terahertz radiation on living systems
A. Woldegeorgis · Generation of sub GV/m longitudinal terahertz electric fields from intense laser-solid density plasma interactions	V. Denysenkov · Overhauser DNP applications at 9.4 Tesla by using terahertz irradiation
D. Zhang · Coherent multichannel dynamics of aligned molecules resolved by two dimensional high-harmonic and terahertz spectroscopy (2D-HATS) (invited)	V. Anfertev · Application of high resolution subTHz spectroscopy methods for analysing the content of grain odors
11:00-11:30	
11:30-13:30	
13:30-14:30	

	Hall A	Hall B
Wednesday, October 24		
14:30-16:30	S1.4 Electronic sources of THz & MW radiation, synchrotron radiation, free-electron lasers	S4.2 Quantum cascade lasers
	Chairman: Yoshinori Tatematsu	Chairman: Rustam Khabibullin
	A. Marek · <i>Simulation of components for gyro-devices coupled in a feedback loop to generate ultra-short RF pulses</i>	A. Baranov · <i>Long wavelength InAs-based quantum cascade lasers (keynote)</i>
	V. Zaslavsky · <i>Terahertz-Range Gyrodevices of Planar Geometry</i>	A. Khudchenko · <i>Overview of Techniques for THz QCL phase-locking (invited)</i>
	D. Sobolev · <i>3D printed periodic structures for subterahertz sources</i>	K. Maremyanin · <i>Investigation of the emission spectra of pulsed THz quantum cascade lasers and their use for magnetospectroscopy of semiconductors</i>
	V. Tsarev · <i>Quasi-fractal PBG structures for Multi-Beam Devices</i>	M. Nazarov · <i>Polymer waveguides for THz QCL radiation delivery and filtering (invited)</i>
	S7.1 Interaction of high-power THz and MW radiation with matter. Application of THz radiation for the research and control of ultrafast process in physics, chemistry and biology	I. Vasil'evskii · <i>Temporal stability and absolute composition issues in molecular beam epitaxy of AlGaAs/GaAs THz QCL</i>
	V. Pavelyev · <i>Terahertz optical elements for control of high-power laser irradiation (keynote)</i>	F. Zubov · <i>3 THz quantum-cascade laser with metallic waveguide based on resonant-phonon depopulation scheme</i>
16:30-17:00	Coffe break	
17:00-18:30	Poster session 2 (sections S1-S5)	
20:00	Conference dinner	

	Hall C	Hall D
Wednesday, October 24		
	S3.4 Generation of THz radiation by intense laser pulses	S10.3 Medical and biological applications of THz radiation
	Chairman: Kodo Kawase	Chairman: Vladimir Vaks
	M. Clerici · <i>Broadband THz generation and detection (invited)</i>	M. Nazarov · <i>Spectroscopy of solutions in the low frequency extended THz frequency range (invited)</i>
	S. Sychugin · <i>Generation of DC fields ahead of ultrashort laser pulses in electro-optic crystals</i>	O. Cherkasova · <i>Study of blood and its components by terahertz pulsed spectroscopy (invited)</i>
	Yu. Klimachev · <i>THz sources based on frequency conversion of multi-line molecular lasers in nonlinear crystals and on optically pumped molecular lasers</i>	I. Ozheredov · <i>Application of THz radiation for in situ control of eye cornea hydration level (invited)</i>
	N. Kuzechkin · <i>Study of the cluster formation dynamics and its affect on generation of THz and X-Ray radiation in the expanding gas jet</i>	M. Khodzitsky · <i>THz time-domain spectroscopy for non-invasive assessment of water content in biological samples</i>
	I. Kinyaevskiy · <i>CO laser down-conversion into the THz range with ZnGeP₂ crystal</i>	S6.2 Study of materials (including nano- and metamaterials) with the help of THz & MW radiation. Time-domain and CW spectroscopy
	S. Bodrov · <i>A modified tilted-pulse-front excitation scheme for efficient terahertz generation in LiNbO₃</i>	K. Motovilov · <i>Water and conductivity in bioorganic materials: complicated interplay (invited)</i>
		E. Zhukova · <i>H₂O molecules hosted by a crystalline matrix – new state of water.(invited)</i>

	Hall A	Hall B
Thursday, October 25		
9:00-9:40	Plenary session 4	
	Chairman: Vladimir Bratman	
	Nikolay Vinokurov · <i>Generating High Power Terahertz and Far Infrared Electromagnetic Radiation with Relativistic Electrons</i>	
09:40-11:10	Special Section "Status of the User Facilities Centers"	S9.1 Systems of security and non-destructive control using THz and MW radiation. Remote sensing with THz radiation. Communication in THz frequency range
	Chairman: Boris Knyazev	Chairman: Leonid Skvortsov
	M. Glyavin · <i>From millimeter to microns - IAP RAS powerful sources for various applications</i> (keynote)	S. Varentsova · <i>Detection and identification of a substance with an inhomogeneous surface using the effective time-dependent THz spectroscopy method and emission frequency up-conversion</i> (invited)
	Y.U. Jeong · <i>Ultrafast THz-pump & Electron-probe Facility at KAERI</i> (keynote)	Yu. Choporova · <i>Measuring the topological charge of vortices with diffraction and interference techniques</i>
	O. Shevchenko · <i>Novosibirsk free electron laser facility</i> (keynote)	D. Pavelev · <i>Devices and system based on quantum semiconductor superlattices for the frequency range 0.1-10 THz.</i>
		A. Angeluts · <i>Influence of pollution and extraneous inclusions on the scattering of THz radiation by fabric</i>
		A. Fokin · <i>Using a gyrotron as a source of modulated radiation for data transmission systems in the terahertz range</i>
11:10-11:40	Coffe break	

Hall C	Hall D
S7.2 Interaction of high-power THz and MW radiation with matter. Application of THz radiation for the research and control of ultrafast process in physics, chemistry and biology	
Chairman: Andrey Stepanov	
A. Savel'ev · <i>Nonlinear Transfer of Intense Few Cycle Terahertz Pulse Through Opaque semiconductors</i> (invited)	
S. Kozlov · <i>Disappearance of Self-Focusing for Few-Cycle THz Pulses</i> (invited)	
M. Krikunova · <i>Ultrafast multi-electron dynamics studied with THz-field streaking</i>	
K. Grishunin · <i>Terahertz induced magnetization dynamic in a weak ferromagnet FeBO₃</i>	
S. Pavlov · <i>Challenges of Raman scattering at THz frequencies</i>	

	Hall A	Hall B
Thursday, October 25		
11:40-13:30	Special Section "Status of the User Facilities Centers"	S5.1 Detection of THz & MW radiation. Metrology in THz frequency range
	Chairman: Young Uk Jeong	Chairman: Vyacheslav Vdovin
	B. Knyazev · <i>Recent experiments at NovoFEL user stations (keynote)</i>	G. Kitaeva · <i>Optical – terahertz biphotons (invited)</i>
	J.M. Klopff · <i>THz science at FELBE (keynote)</i>	I. Ilyakov · <i>Terahertz Electro-Optic Sampling in Crystals with High Natural Birefringence</i>
	G.P. Gallerano · <i>Terahertz and mm-wave applications at ENEA-Frascati (keynote)</i>	A. Bogatskaya · <i>Optical-mechanical analogy approach for the purposes of detection of IR-MW radiation</i>
		V. Koshelets · <i>Low-noise THz-range SIS Receivers for Ground-based and Space Radio Astronomy</i>
		A. Shugurov · <i>Terahertz pulse detection by direct intensity modulation of the probe laser beam in GaAs</i>
		E. Suchkov · <i>Terahertz, sub-mm and millimeter wave instrumentation and components</i>
13:30-14:30	Lunch	

Hall C	Hall D
	S6.3 Study of materials (including nano- and metamaterials) with the help of THz & MW radiation. Time-domain and CW spectroscopy
	Chairman: Mikhail Tretyakov
	A. Nikitin · <i>Terahertz plasmonics: achievements and prospects (invited)</i>
	N. Nikolaev · <i>Oxide nonlinear crystals: optical properties and phase-matching for terahertz wave generation (invited)</i>
	E. Serov · <i>Dielectrics for output windows of medium power gyrotrons</i>
	S. Bodrov · <i>Terahertz induced optical second harmonic generation from dielectric interfaces: mechanism and application</i>
	M. Gafurov · <i>Coherent control of electron-nuclear states of rare-earth ions in crystals using radio-frequency and microwave radiation.</i>
	M. Khodzitsky · <i>Optically tunable dielectric properties of single-walled carbon nanotubes for terahertz wave applications</i>

	Hall A	Hall B
	Thursday, October 25	
14:30-16:00	S9.2 Systems of security and non-destructive control using THz and MW radiation. Remote sensing with THz radiation. Communication in THz frequency range	S5.2 Detection of THz & MW radiation. Metrology in THz frequency range
	Chairman: Alexander Kostrov	Chairman: Dmitry Khokhlov
	P. Mounaix · <i>Submillimeter wave Tomography and image processing advances: Applications additive manufacturing quality control (invited)</i>	V. Vdovin · <i>Arrays of annular antennas with SINIS bolometers for SubTHz radioastronomy</i>
	L. Skvortsov · <i>The concept of construction of inspection systems based on quantum-cascade lasers</i>	I. Andreev · <i>Imaging of powerful terahertz beams</i>
	G. Katyba · <i>Microstructured sapphire shaped crystals for antiresonant and bandgap terahertz waveguiding</i>	A. Sobolev · <i>Wideband metamaterial-based array of SINIS bolometers</i>
	S8. Terahertz & microwave imaging: tomography, holography and near-field microscopy	A. Khudchenko · <i>Sideband Separating SIS receiver for 650 GHz developed by NOVA</i>
	I. Dolganova · <i>Impact of Scattering in Quasi-Ordered Structures on THz Imaging</i>	L. Kuzmin · <i>Efficient electron cooling in Cold Electron Bolometers</i>
	A. Martusevich · <i>Comparative study of dielectric properties of the skin of human and laboratory animals</i>	A. Mamrashev · <i>Terahertz time-domain spectrometer with precision delay line encoder</i>
16:00-16:30	CLOSING SESSION (Hall A)	

Hall C	Hall D
S7.3 Interaction of high-power THz and MW radiation with matter. Application of THz radiation for the research and control of ultrafast process in physics, chemistry and biology	S6.4 Study of materials (including nano- and metamaterials) with the help of THz & MW radiation. Time-domain and CW spectroscopy
Chairman: Vladimir Pavelyev	Chairman: Elena Zhukova
V. Kubarev · <i>Experiments using extreme parameters of NovoFEL radiation (invited)</i>	A. Boris · <i>Exploring in-gap excitations in high-Tc superconducting films by THz and infrared spectroscopy (invited)</i>
R. Zhukavin · <i>Relaxation of Coulomb states in semiconductors probed by FEL radiation</i>	N. Nikolaev · <i>Angle-Susceptible Sensing Metasurface in Terahertz Regime</i>
O. Chefonov · <i>Interaction of high-power terahertz radiation with metallic films</i>	M. Bezhko · <i>Dielectric and Magnetic Material Characterization Techniques up to 1,5 THz</i>
	A.A. Gavidush · <i>Terahertz time-domain spectroscopy of astrophysical ice analogs: a pilot study</i>

Poster Session 1. Tuesday, October 23

S6. Study of materials (including nano- and metamaterials) with the help of THz & MW radiation. Time-domain and CW spectroscopy

- P.6.1 **V. Kukotenko** · *Single-color pump-probe setup at the NovoFEL facility for measurements of carrier relaxation dynamics in semiconductors*
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- P.6.7 **A. Grebenchukov** · *Terahertz spectroscopy of graphene-based materials on different substrates under external infrared optical pumping*
- P.6.8 **E. Litvinov** · *Aligned planar-wire zero-index metamaterial for terahertz frequency range*
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- P.8.3 **O. Kameshkov** · *Generation of vortex beamlet lattices via diffraction of Bessel vortex beams on 2D hole arrays: analytical and numerical calculations and comparison with experiments*
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- P.10.3 **I. Kublanova** · *The research method of a qualitative analysis of the composition of the blood in the terahertz frequency range.*
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- P.10.6 **T. Zhang** · *Study of PVC-based Skin Phantom with graphite particles in Terahertz Frequency Range*
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- P.1.2 **A. Badarin** · *Double-Beam Millimeter-Wave Band BWT And TWT On A Spirally Bent Rectangular Waveguide*
- P.1.3 **K. Leshcheva** · *Electron-optics systems with decreased life-time of trapped electrons for terahertz band gyrotrons*
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- P.1.6 **R. Rozental** · *Gyrotrons with shortened cavities as tunable sources of powerful subterahertz radiation for spectroscopic applications*
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- P.1.8 **A. Zuev** · *The project of third harmonic medium power W-band gyroron*
- P.1.9 **E. Myasin** · *Unknown peculiarity of the orotron two row periodic structure*
- P.1.10 **M. Vilkov** · *Generation of Ultrashort Microwave Pulses in Passive Mode-Locked Electron Oscillators with Homogeneous and Inhomogeneous Line Broadening*
- P.1.11 **R. Rozental** · *Generation of Ultra-Short Microwave Pulses in a Tunable Gyrotron with Subsequent Compression*
- P.1.12 **A. Fokin** · *Frequency control in subterahertz gyrotrons*
- P.1.13 **A. Fedotov** · *Design of mm-wave slow-wave devices with sheet and hollow electron beams*
- P.1.14 **I. Davidyuk** · *Fast magnetic measurements of 8.6 m undulator*
- P.1.15 **V. Zaslavsky** · *Powerful surface-wave oscillators with one-dimensional and two-dimensional periodic planar structures*
- P.1.16 **V. Zapevalov** · *Various types of echelette resonators for gyrotrons*
- P.1.17 **L. Yurovsky** · *Transformation of High-Power Gyrotron Output Radiation Frequency under Conditions of Raman Scattering on Auxiliary Electron Beam*
- P.1.18 **N. Pristupchik** · *Design and process flow of the buried-emitter cathode for a low-power terahertz BWO*
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Institute of Applied Physics RAS, Nizhny Novgorod, Russia
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Dmitry Khokhlov^{1,2}, A. V. Galeeva¹, L. I. Ryabova³
¹Physics Department, M.V. Lomonosov Moscow State University, Moscow, Russia,
²P.N. Lebedev Physical Institute, Moscow, Russia
³Chemistry Department, M.V. Lomonosov Moscow State University, Moscow, Russia
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Chi-Kuang Sun
Graduate Institute of Photonics and Optoelectronics, National Taiwan University, Taipei, Taiwan
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Alessandro Tredicucci^{1,2}
¹Dipartimento di Fisica "E. Fermi", Università di Pisa, Italy
²NEST, CNR Istituto Nanoscienze and Scuola Normale Superiore, Pisa, Italy
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Institute of Electronic Structure and Laser, Heraklion, Greece
Department of Materials Science and Technology, University of Crete, Heraklion, Greece
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¹Privolzhsky Research Medical University, Nizhny Novgorod, Russia
²Kirov State Medical University, Kirov, Russia
³Institute of Applied Physics RAS, Nizhny Novgorod, Russia
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N. A. Vinokurov^{1,2}

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²Novosibirsk State University, Novosibirsk, Russia

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S1. Electronic sources of THz & MW radiation, synchrotron radiation, free-electron lasers

1. *Study of mutual phase locking of two gyrotrons coupled with delay*
A.B. Adilova¹, N.M. Ryskin^{1,2}
¹Saratov State University, Saratov, Russia
²Saratov Branch, Institute of Radio Engineering and Electronics, Saratov, Russia
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²Novosibirsk State University, Novosibirsk, 630090, Russia
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¹Ariel University, Ariel, Israel
²Institute of Applied Physics of RAS, Nizhny Novgorod, Russia
³Nizhny Novgorod State University, Nizhny Novgorod, Russia
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¹Budker INP SB RAS, Novosibirsk, Russia
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A.D. Grigoriev^{1,2}
¹Saint Petersburg State Electrotechnical University "LETI", St. Petersburg, Russia
²"Svetlana-Electronpribor" JSC
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- V.N.Manuilov^{1,2}, A.L.Goldenberg¹, M.Yu.Glyavin¹, K.A.Leshcheva^{1,2}**
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²Saratov State University, Saratov, Russia
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²Institute for Research in Electronics and Applied Physics, University of Maryland, USA
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²N. I. Lobachevsky State University, Nizhny Novgorod, Russia
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 Institute of Applied Physics of the RAS, Nizhny Novgorod, Russia
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S2. Optoelectronic & solid-state sources of THz radiation

1. *THz stimulated emission at interband transitions in HgTe/CdHgTe quantum wells*
V.I.Gavrilenko¹, V.V.Rumyantsev¹, A.A.Dubinov¹, S.V.Morozov¹, N.N.Mikhailov², S.A.Dvoretzky², F.Teppe³, C.Sirtori⁴

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⁴Laboratory of Materials and Quantum Phenomena, University Paris-Diderot, Paris, France
2. *Electronic Tunneling and Electric Domains in GaAs/AlAs Superlattices at Room Temperature*
I. V. Altukhov¹, M. S. Kagan¹, S. K. Paprotskiy¹, N. A. Khvalkovskiy¹, I. S. Vasil'evskii², A. N. Vinichenko²
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 3. *Wideband Josephson THz flux-flow oscillator integrated with the slot lens antenna and the harmonic mixer*
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 4. *Evidence of synchronization of large Josephson-junction arrays by travel-ing electromagnetic waves*
M.A. Galin^{1,2}, E. A. Borodianskiy², V. V. Kurin¹, I. A. Shereshevskiy¹, N. K. Vdovicheva¹, V. M. Krasnov², A.M. Klushin¹
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 5. *Long-Pulsed Modulation Regimes of Subterahertz Nanosecond Waveguide Switches*
Maxim L. Kulygin¹, G. G. Denisov^{1,2}, A. P. Fokin¹, E. A. Novikov¹, S. H. Salahetdinov¹, S. V. Shubin¹, I. A. Litovsky²
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 6. *Active Josephson traveling wave antennae as prospective terahertz oscillators*
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 7. *Generation of THz radiation by photoconductive antennas on based thin films InGaAs and InGaAs/InAlAs.*
A.A. Leontyev¹, K.A. Kuznetsov¹, G.B. Galiev², G.Kh. Kitaeva¹, V.V. Kornienko¹, E.A. Klimov², A.N. Klochkov², S.S. Pushkarev², P.P. Maltsev²
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 8. *High Photoconductivity in Heavily Doped GaAs/AlAs Superlattices with Electric Domains*
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 9. *Plasmonic terahertz antennas with high-aspect ratio metal gratings*
A.E. Yachmenev^{1,2}, D.V. Lavrukhin^{1,2}, I.A. Glinskiy^{1,2}, R.A. Khabibullin^{1,2,3}, R.R. Galiev¹, A.Yu. Pavlov^{1,2}, Yu.G. Goncharov², I.E. Spektor², M. Ryzhii⁵, T. Otsuji⁶, K.I. Zaytsev^{2,4}, D.S. Ponomarev^{1,2,3}
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 10. *Doubling of gyrotron radiation frequency due to nonlinear susceptibility in A3B5 semiconductors*
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 11. *Molecular beam epitaxial growth of semiconductor heterostructures for THz electronics*
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 12. *Continuously Tunable Spintronic Emission in the sub-THz Range*
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 13. *Frequency comb for THz metrology and spectroscopy*
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14. *Theoretical and experimental studies of dielectric two-dimensional Bragg structures for development of spatially-extended heterolasers*
N.Yu. Peskov, V.R. Baryshev, N.S. Ginzburg, E.R. Kocharovskaya, A.M. Malkin, D.M. Padozhnikov, M.D. Proyavin, V.Yu. Zaslavsky
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15. *Terahertz lasers based on donor intracenter transitions in silicon*
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S3. Generation of THz radiation by intense laser pulses

1. *A modified tilted-pulse-front excitation scheme for efficient terahertz generation in LiNbO₃*
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2. *Laser induced THz Sommerfeld waves along metal wire*
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3. *Modulation of two-color laser-induced filament terahertz emission by effective length variation*
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4. *CO laser down-conversion into the THz range with ZnGeP₂ crystal*
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5. *THz sources based on frequency conversion of multi-line molecular lasers in nonlinear crystals and on optically pumped molecular lasers*
A. A. Ionin, I. O. Kinyaevskiy, Yu. M. Klimachev, A. A. Kotkov, A. M. Sagitova
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6. *Temperature variation in the process of terahertz wave generation by intense laser pulses*
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7. *Role of surface plasmons in laser-induced THz generation from metals*
I. V. Oladyshkin, D. A. Fadeev, V. A. Mironov
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8. *Interplay effects of carrier-envelope phase and plasmon resonances in terahertz generation by ionizing ultrashort optical pulses*
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9. *New Approach to Generation and Amplification of the THz Radiation in Plasma Created by Intense Two-Color Laser Fields*
A. M. Popov^{1,2,3}, A. V. Bogatskaya^{1,3}
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10. *Terahertz radiation in two-color laser fields: from single atom to extended gas response*
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11. *Manipulation of Highly Nonlinear Organic Crystals for Efficient Optical-to-THz Conversion*
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12. *Broadband THz generation and detection*
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13. *The dipole mechanism of terahertz waves emission under laser action on clusters*
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14. *Multi wavelength injection-seeded THz parametric system*
Kosuke Murate, Kodo Kawase
Department of Electronics, Nagoya University, Nagoya, Japan
15. *THz Nonlinear Photonics: Generation and Applications*
Fabian Rotermund
Department of Physics, Advanced Institute of Science and Technology, Daejeon South Korea
16. *Coherent Multichannel Dynamics of Aligned Molecules Resolved by Two Dimensional High-Harmonic and Terahertz Spectroscopy (2D-HATS)*
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17. *Generation of terahertz radiation on the difference frequency in ZnGeP₂*
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18. *Generation of broadband terahertz radiation in ZnGeP₂ by optical rectification*
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19. *Terahertz generation from single and multiple filaments in air*
O. Kosareva^{1,2,3}, N. Panov^{1,2}, D. Shipilo^{1,2}, V. Andreeva^{1,4}, T.-J. Wang⁵, Y. Chen⁶, W. Liu³, A. Savel'ev¹, A. Shkurinov¹
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20. *Resonant Effects in Terahertz Generation with Laser-Induced Gas Plasmas*
I. Thiele^{1,2}, B. Zhou³, A. Nguyen⁴, E. Smetanina^{1,5}, R. Nuter¹, P. González de Alaiza Martínez¹, K. J. Kaltenecker³, J. Déchard⁴, L. Bergé⁴, P. U. Jepsen³, S. Skupin^{1,6}
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21. *Terahertz Wave Generation from Liquefied Gas*
A.V. Balakin^{1,2}, A.F. Bunkin³, V.A. Makarov^{1,4}, I.A. Kotelnikov^{5,6}, N.A. Kuzechkin^{1,2}, A.B. Savelev¹, P.M. Solyankin^{1,2}, A.P. Shkurinov^{1,2,4}
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22. *Backward terahertz emission from two-color laser induced plasma spark*
Aleksandr Ushakov^{1,2}, Pavel Chizhov¹, Vladimir Bukin¹, Nikolay Panov², Daniil Shipilo², Olga Kosareva², Andrei Savel'ev², Sergey Garnov¹
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23. *Generation of sub GV/m longitudinal terahertz electric fields from intense laser-solid density plasma interactions*
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24. *Laser-plasma generation of tunable ultrashort pulses in terahertz and mid-infrared ranges*
A. A. Silaev^{1,2}, V. A. Kostin^{1,2}, I. D. Laryushin^{1,2}, N. V. Vvedenskii^{1,2}
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25. *Quantum-mechanical simulations of low-frequency current excitation during ionization of many-electron atoms by intense laser pulses*
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26. *Plasma mechanisms of terahertz electromagnetic wave generation due to intense laser-plasma interaction*
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27. *THz nonlinear optics in the sub-cycle regime*
Tsuneyuki Ozaki
 Institut national de la recherche scientifique, Quebec, Canada
28. *Generation of DC fields ahead of ultrashort laser pulses in electro-optic crystals*
E.S. Efimenko¹, S.A. Sychugin², M.V. Tsarev³, M.I. Bakunov²
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²University of Nizhny Novgorod, Nizhny Novgorod, Russia,
³Ludwig-Maximilians-Universität München, Garching, Germany
29. *Study of the cluster formation dynamics and its affect on generation of THz and X-Ray radiation in the expanding gas jet*
A. V. Balakin^{1,2}, M. S. Dzhidzhoev¹, V. M. Gorgienko¹, I. A. Zhvaniya¹, I. E. Ivanov¹, N. A. Kuzechkin^{2,1}, P. M. Solyankin^{2,1}, A. P. Shkurinov^{1,2,3}
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- #### S4. Quantum cascade lasers
1. *Quantum-cascade lasers of mid-IR spectral range: epitaxy, diagnostics and device characteristics*
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2. *Polymer waveguides for THz QCL radiation delivery and filtering*
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3. *Terahertz quantum cascade lasers with silver- and gold-based waveguides*
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4. *Overview of Techniques for THz QCL phase-locking*
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5. *Characterization of the THz quantum cascade laser using fast superconducting hot electron bolometer*
Yu. V. Lobanov^{1,2}, Yu. B. Vakhtomin^{1,2}, I. V. Pentin^{1,2}, R. A. Khabibullin³, N. V. Shchavruk³, K. V. Smirnov^{1,2,4}
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6. *3 THz quantum-cascade laser with metallic waveguide based on resonant-phonon depopulation scheme*
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7. *Temporal stability and absolute composition issues in molecular beam epitaxy of AlGaAs/GaAs THz QCL*
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8. *Bloch and Wannier-Stark THz stimulated emissions in superlattices: rival of Quantum Cascade Laser?*
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9. *THz Quantum Cascade Laser disc cavities emission beams and losses*
A.A. Andronov, V.I. Pozdnjakova
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10. *Investigation of the emission spectra of pulsed THz quantum cascade lasers and their use for magnetospectroscopy of semiconductors*
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11. *Reconfigurable terahertz optics based on etched structures in vanadium dioxide thin films*
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12. *Generation of ultra-short pulses via self-induced transparency mode-locking regime in lasers*
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13. *Metrological Grade THz Radiation*
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14. *Long wavelength InAs- based quantum cascade lasers*
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S5. Detection of THz & MW radiation. Metrology in THz frequency range

1. *Imaging of powerful terahertz beams*
I. V. Andreev, V. M. Muravev, A. R. Khisameeva, G. E. Tsydynzhapov, I. V. Kukushkin
 MWAVE LLC, Moscow, Russia
2. *Optical-Mechanical Analogy Approach for the Purposes of Detection of IRMW Radiation*
A.V. Bogatskaya^{1,2,3}, N.V. Klenov^{1,3,4,5}, M.V. Tereshonok^{3,5}, A.M. Popov^{1,2,4}
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³Moscow Technical University of Communication and Informatics, Moscow, Russia
⁴Department of Physics, Moscow State University, Moscow, Russia
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3. *Efficient electron cooling in Cold Electron Bolometers*
A.V. Gordeeva^{1,2}, A.L. Pankratov^{1,2}, V.O. Zbrozhek¹, A.V. Blagodatkina^{1,2}, L.S. Revin^{1,2}, D.A. Pimanov¹, L.S. Kuzmin^{1,3}
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4. *Terahertz Electro-Optic Sampling in Crystals with High Natural Birefringence*
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⁴M.V. Lomonosov Moscow State University, Faculty of Physics, Moscow, Russia
5. *Optical-Terahertz Biphotons*
G.Kh. Kitaeva
 Lomonosov Moscow State University, Moscow, Russia
6. *Cold-electron bolometer as a photon-noise-limited detector with on-chip electron self-cooling*
L.S. Kuzmin^{1,2}, A.L. Pankratov^{1,3}, A.V. Gordeeva^{1,3}, V.O. Zbrozhek¹, A.V. Blagodatkina^{1,3}, L.S. Revin^{1,3}
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²Chalmers University of Technology, Gothenburg, Sweden
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7. *Terahertz Time-Domain Spectrometer with Precision Delay Line Encoder*
A. A. Mamrashev¹, F. A. Minakov^{1,2}, L. V. Maximov^{1,2}, N. A. Nikolaev¹, P. L. Chapovsky^{1,2}
¹Institute of Automation and Electrometry SB RAS, Novosibirsk, Russia
²Novosibirsk State University, Novosibirsk, Russia
8. *Temperature dependence of signal spectra generated via spontaneous parametric down-conversion in strongly frequency non-degenerate regime*
T.I. Novikova, K.A. Kuznetsov, G.Kh. Kitaeva
MSU Physics Faculty, Moscow, Russia
9. *Wideband metamaterial-based array of SINIS bolometers*
A.S. Sobolev^{1,2}, B. Beiranvand¹, A.M. Chekushkin^{1,2}, A.V. Kudryashov¹, M.A. Tarasov^{1,3}, R.A. Yusupov^{1,2}, A. Gunbina⁴, V.F. Vdovin⁴, V. Edelman⁵
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³Chalmers University of Technology, Gothenburg, Sweden
⁴Institute of Applied Physics, N.Novgorod, Russia
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10. *Arrays of annular antennas with SINIS bolometers for radioastronomy*
M. Tarasov¹, A. Gunbina^{2,5}, M.Mansfeld^{2,5}, G. Yakopov⁴, A.Chekushkin¹, R. Yusupov¹, S.Lemzyakov⁶, V. Edelman⁶, V. Vdovin^{2,3,5}
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11. *Sideband Separating SIS receiver for 650 GHz developed by NOVA*
A. Khudchenko^{1,2}, R. Hesper¹, A.M. Baryshev^{1,3}, J. Barkhof¹, J. Adema¹, M.E. Bekema¹, L.H.R. de Haan-Stijkel¹, W.H.W.M. Boland⁴
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³Astro Space Center, Lebedev Physical Institute of RAS, Moscow, Russia
⁴University of Leiden/NOVA, Leiden, Netherlands
12. *Technology for NbN HEB based multipixel matrix of THz range*
Ivan Tretyakov¹, N. Kaurova¹, S. Raybchun¹, G.N. Goltsman¹
¹Department of Physics, Moscow State University of Education, 29 Malaya Pirogovskaya St, Moscow, Russia
13. *Future scientific experiment "SUN-TERAHERTZ"*
M.V. Philippov, V.S. Makhmutov, Y. I. Stozhkov, E.V. Kalinin, A.A. Kvashnin
Lebedev Physical Institute of the RAS (LPI RAS)
14. *Response of carbon nanotube film transistor to the THz radiation*
V. V. Belosevich¹, I. A. Gayduchenko², N. A. Titova², E. S. Zhukova¹, G. N.

Goltsman², G. E. Fedorov¹

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15. *Low-noise THz-range SIS Receivers for Ground-based and Space Radio Astronomy*
Kirill Rudakov^{1,2,3}, Pavel Dmitriev¹, Andrey Baryshev², Andrey Khudchenko^{1,2}, Ronald Hesper², Valery Koshelets¹
¹Kotel'nikov Institute of Radio Engineering and Electronics RAS, Moscow, Russia,
²Kapteyn Astronomical Institute, University of Groningen, Groningen, the Netherlands
³Moscow Institute of Physics and Technology, Dolgoprudny, Russia
 16. *Terahertz pulse detection by direct intensity modulation of the probe laser beam in GaAs*
A.I. Shugurov, M. I. Bakunov
University of Nizhny Novgorod, Nizhny Novgorod, Russia
 17. *Spectral measurements of THz radiation emitted from intrinsic Josephson junction stacks*
V.P. Koshelets¹, N.V. Kinev¹, A.B. Ermakov¹, F. Rudau², R. Wieland², D. Koelle², R. Kleiner², H.B. Wang³
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²Physikalisches Institut und Center for Collective Quantum Phenomena in LISA+, Universität Tübingen, Germany
³Research Institute of Superconductor Electronics, Nanjing University, China.
 18. *Array of planar antennas with SINIS bolometers for BTA*
G. Yakopov⁴, M. Tarasov¹, A. Gunbina^{2,5}, M.Mansfeld^{2,5}, R. Yusupov¹, V. Edelman⁶, V. Vdovin^{2,3,5}
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⁵Nizhny Novgorod State Technical University n.a. R.E. Alekseev
⁶P.Kapitza Institute for Physical Problems RAS
 19. *Terahertz, sub-mm and millimeter wave instrumentation and components*
Evgeny Suchkov
Rohde & Schwarz
- S6. Study of materials (including nano- and metamaterials) with the help of THz & MW radiation. Time-domain and CW spectroscopy**
1. *Modelisation of a gas phase polarization induced by a 200 GHz chirped pulse*
R. Bocquet¹, D. Fontanari¹, C. Bray¹, G. Mouret¹, A. Cuisset¹, G. Dhont¹, K. Hickson², F.Hindle¹
¹LPCA, Universite du Littoral Cote d'Opale, 59140 Dunkerque, France
²Institut des Sciences Moleculaires, Universite de Bordeaux, Talence, F-33400, France

2. *Terahertz induced optical second harmonic generation from dielectric interfaces: mechanism and application*
S.B. Bodrov^{1,2}, Yu.A. Sergeev², A.I. Korytin², M.Y. Emelin², M.Y. Ryabikin², A.N. Stepanov²
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3. *Coherent control of electron-nuclear states of rare-earth ions in crystals using radio-frequency and microwave radiation*
M. R. Gafurov, G.V. Mamin, E.I. Baibekov, I. N. Kurkin, F.F. Murzakhanov, S.B. Orlinskii
 Kazan Federal University, Kazan, Russian Federation
4. *Terahertz time-domain spectroscopy of astrophysical ice analogs: a pilot study*
A. A. Gavdush^{1,2}, B. M. Giuliano³, B. Müller³, G. A. Komandin¹, M. E. Palumbo⁴, G. A. Baratta⁴, C. Sciré⁴, S. O. Yurchenko², K. I. Zaytsev^{1,2}, A. V. Ivlev³, P. Caselli³
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³Max-Planck-Institute für extraterrestrische Physik, Garching bei München, München, Germany
⁴Osservatorio Astrofisico di Catania, Catania, Italy
5. *Accurate broadband THz molecular spectroscopy*
Krupnov A.F., Belov S.P., Tretyakov M.Yu., Golubiatnikov G.Yu., Parshin V.V., Koshelev M.A., Serov E.A., Vilkov I.N., Makarov D.S., Bubnov G.M., Leonov I.I., Chernova A.I., Andriyanov A.F., Shkaev A.P.
 Institute of Applied Physics RAS, Nizhny Novgorod, Russia
6. *Pulsed magnets with high field intensity for laser-plasma experiments and TDS spectroscopy*
T. Krapivnitskaia, A. Luchinin, V. Malyshev, M. Morozkin, M. Starodubtsev, M. Proyavin, A. Fokin, M. Glyavin
 Institute of Applied Physics, Nizhny Novgorod, Russia
7. *Single-color pump-probe setup at the NovoFEL facility for measurements of carrier relaxation dynamics in semiconductors*
V. D. Kukotenko^{1,3}, Y. Y. Choporova^{1,2}, Boris A. Knyazev^{1,2}, V. V. Gerasimov¹, R. K. Zhukavin⁴, K. A. Kovalevsky⁴
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²Novosibirsk State University, Novosibirsk, Russia
³Novosibirsk State Technical University, Novosibirsk, Russia
⁴Institute for Physics of Microstructures, Nizhny Novgorod, Russia
8. *Generation of terahertz pulses from the island films of topological insulator $Bi_{2-x}Sb_xTe_{3-y}Se_y$*
K.A. Kuznetsov¹, G.Kh. Kitaeva¹, P.I. Kuznetsov², G.G. Yakushcheva²
¹M.V. Lomonosov Moscow State University, Moscow Russia
²Kotelnikov IRE RAS (Fryazino branch), Fryazino, Russia
9. *Aligned planar-wire zero-index metamaterial for terahertz frequency range*
E.A. Litvinov¹, P. S. Demchenko¹, E.B. Shekhanova², M.K. Khodzitsky¹
¹Terahertz Biomedicine Laboratory, Saint-Petersburg, Russia
²International Laboratory "Nonlinear optical molecular crystals and microlasers", Saint-Petersburg, Russia
10. *Angle-Susceptible Sensing Metasurface in Terahertz Regime*
N. A. Nikolaev^{1,2}, S. A. Kuznetsov^{3,4}, M. Beruete⁵
¹Institute of Automation and Electrometry SB RAS, Novosibirsk, Russia
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³Rzhanov Institute of Semiconductor Physics SB RAS, Novosibirsk Branch "TDIAM", Novosibirsk, Russia
⁴Novosibirsk State University, Novosibirsk, Russia
⁵Public University of Navarra, Pamplona, Spain
11. *Far IR continuum absorption of $H_2^{16}O$ and $H_2^{18}O$*
T.A. Odintsova¹, M.Yu. Tretyakov¹, A.O. Zibarova^{1,2}, O. Pirali³, P. Roy³, A. Campargue⁴
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³SOLEIL Synchrotron, L'Orme des Merisiers, France
⁴Univ. Grenoble Alpes, CNRS, LIPhy, 38000 Grenoble, France
12. *Oxide nonlinear crystals: optical properties and phase-matching for terahertz wave generation*
O. I. Potaturkin¹, V. D. Antsygin¹, A. A. Mamrashev¹, N. A. Nikolaev¹, Yu. M. Andreev^{2,3}, G. V. Lanskii^{2,3}, V. A. Svetlichnyi³, K. A. Kokh⁴
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²Institute of Monitoring of Climatic and Ecological Systems SB RAS, Tomsk, Russia
³Siberian Physical Technical Institute of Tomsk State University, Tomsk, Russia
⁴Institute of Geology and Mineralogy SB RAS, Novosibirsk, Russia
13. *Terahertz induced optical second harmonic generation from silicon surface*
S.B. Bodrov^{1,2}, A.I. Korytin¹, Yu.A. Sergeev¹, A.N. Stepanov¹
¹Institute of Applied Physics of the RAS, Nizhny Novgorod, Russia,
²University of Nizhny Novgorod, Nizhny Novgorod, Russia
14. *Dielectrics for output windows of medium power gyrotrons*
E. Serov¹, V. V. Parshin¹, S. V. Egorov¹, A. N. Konovalov², A. I. Makarov¹, K. V. Vlasova¹
¹Institute of Applied Physics of the RAS, Nizhny Novgorod, Russia
²Quartz technologies Ltd, Shilovo, Ryazan' region, Russia
15. *Effect of MIT in epitaxial VO₂ films on THz transmittance*
D. I. Sharovarov^{1,2}, F. Ya. Akbar¹, D. P. Lelyuk³, A. M. Makarevich⁴, O.V. Boytsova^{1,5}, A. R. Kaul^{2,4}
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⁴Department of Chemistry, Moscow State University, Moscow, Russia
⁵Kurnakov Institute of General and Inorganic Chemistry RAS, Moscow, Russia

16. *Investigation of the properties of a 3-level broadband antireflective structure on silicon by THz time-domain spectroscopy*
I. A. Tzibizov¹, G. I. Kropotov¹, V.S. Pavelyev^{2,3}, K. N. Tukmakov^{2,3}, A. S. Reshetnikov²
¹Tydex LLC, St. Petersburg, Russia
²Samara University, Samara, Russia
³Image Processing Systems Institute of the RAS, Russia
17. *Recent results on THz gyrotron-based molecular spectroscopy*
G.Yu. Golubiatnikov, M.A. Koshelev, A.I. Tsvetkov, A.P. Fokin, M.Yu. Glyavin, M.Yu. Tretyakov
 Institute of Applied Physics RAS, Nizhny Novgorod, Russia
18. *H₂O Molecules Hosted By A Crystalline Matrix – New State Of Water?*
E. S. Zhukova¹, M. A. Belyanchikov¹, M. Savinov², P. Bednyakov², V. G. Thomas³, L. S. Kadyrov¹, E. A. Simchuk¹, Z. V. Bedran¹, V. I. Torgashev⁴, A. Dudka⁵, M. Dressel^{1,6}, B. P. Gorshunov¹
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⁵Shubnikov Institute of Crystallography, Federal Scientific Research Centre “Crystallography and Photonics”, RAS, 119333 Moscow, Russia
⁶1. Physikalisches Institut, Universität Stuttgart, 70569 Stuttgart, Germany
19. *Dielectric and Magnetic Material Characterization Techniques up to 1,5 THz*
M.P. Bezhko
 Keysight Technologies, Moscow, Russia
20. *Closing the terahertz gap: a composite approach toward measuring continuous dielectric functions from microwave to visible wavelengths*
Robert D. Dawson, Alexander V. Boris
 Max Planck Institute for Solid State Research, Stuttgart, Germany
21. *Water and Conductivity in Bioorganic Materials: Complicated Interplay*
Konstantin Motovilov¹, Zarina Gagkaeva¹, Artem Grebenko¹, Maxim Savinov², Vadim Grinenko^{3,4}, Aleksei Pronin⁵, Vyacheslav Dremov¹, Anton Bubis¹, Piotr Barzilovich¹, Elena Zhukova¹, Zakhar Bedran¹, Lenar Kadyrov¹, Bernard Mostert⁶, Boris Gorshunov¹
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³Institute for Solid State and Materials Physics, Dresden, Germany
⁴Institute for Metallic Materials, Dresden, Gemany
⁵A.M.Prokhorov General Physics Institute, Russia
⁶Department of Chemistry, Swansea University, United Kingdom
22. *Ceramic materials for microwave applications*
V. V. Parshin¹, Evgeny Serov¹, P.V. Netcvetaeva²
¹Institute of Applied Physics of RAS, N.Novgorod, Russia
²OJSC "Magnetron Plant", St. Petersburg, Russia
23. *Absorbance of oxipane material in THz frequency range*
D. A. Gomon, P. S. Demchenko, M. K. Khodzitsky
 ITMO University, Saint-Petersburg, Russia
24. *Exploring in-gap excitations in high-Tc superconducting films by THz and infrared spectroscopy*
R. D. Dawson, A. V. Boris,
 Max Planck Institute for Solid State Research, Stuttgart, Germany
25. *Study of influence of densification on control of conductivity and spectral characteristics of thin films of carbon nanotubes in terahertz frequency range*
P. Demchenko¹, D. Gomon¹, I. Anoshkin², S. Smirnov², D. Lioubtchenko^{1,2}, M. Khodzitsky¹
¹Department of Photonics and Optical Information Technologies, ITMO University, Saint Petersburg, Russian,
²Department of Micro and Nanosystems, KTH Royal Institute of Technology, Stockholm, Sweden.
26. *Terahertz spectroscopy of graphene-based materials on different substrates under external infrared optical pumping*
A. Grebenchukov¹, A. Zaitsev¹, P. Demchenko¹, M. Novoselov¹, E. Kovalska², A. Baldycheva², M. K. Khodzitsky¹
¹ITMO University (Russian Federation),
²University of Exeter (United Kingdom)
27. *Optically tunable dielectric properties of single-walled carbon nanotubes for terahertz wave applications*
S. Smirnov¹, I.V. Anoshkin^{1,2}, P. Demchenko², D. Gomon², D.V. Lioubtchenko^{1,2}, J. Oberhammer¹, M.K. Khodzitsky²
¹Department of Micro and Nanosystems, KTH Royal Institute of Technology, Sweden;
²Terahertz Biomedicine Laboratory, ITMO University, Russia
28. *Terahertz Range Surface-Wave Bragg Resonators with Optimized Ratio between Ohmic and Radiative Losses*
A. M. Malkin, N.S. Ginzburg, S.E. Fil'chenkov, A.S. Sergeev, aV.Yu. Zaslavsky
 Institute of Applied Physics RAS, NizhnyNovgorod, Russia
29. *Geometry impact on polarizing properties of terahertz chiral metasurface*
M.Masyukov, A. Vozianova, A. Grebenchukov, M. Khodzitsky
 Terahertz Biomedicine Laboratory, ITMO University, Saint Petersburg, Russia
30. *The first observation of the free induction signals of OH radicals in the terahertz region*
E.N.Chesnokov¹, L.N.Krasnoperov², V.V.Kubarev³, P.V.Koshlyakov¹
¹Institute of Chemical Kinetics and Combustion, Novosibirsk, Russia,
²New-Jersey Institute of Technology., Newark,USA
³Institute of Nuclear Physics, Novosibirsk,Russia

31. *Nonlinear quantum interferometry in terahertz spectroscopy*
E.I. Malkova¹, S.P. Kovalev², K.A. Kuznetsov¹, G.Kh. Kitaeva¹
¹M.V. Lomonosov Moscow State University, Moscow, Russia,
²Helmholtz Zentrum Dresden Rossendorf, Dresden, Germany
32. *Millimeter-Wave Spectroscopy of Weakly Bound Molecular Complexes and Small Clusters*
L. A. Surin^{1,2}
¹Institute of Spectroscopy, Troitsk, Moscow, Russia,
²I. Physikalisches Institut, University of Cologne, Cologne, Germany
33. *Terahertz plasmonics: achievements and prospects*
A. K. Nikitin^{1,2}, B. A. Knyazev^{2,3}, V. V. Gerasimov^{2,3}
¹Scientific and Technological Center of Unique Instrumentation, RAS, Moscow, Russia,
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S7. Interaction of high-power THz and MW radiation with matter. Application of THz radiation for the research and control of ultrafast process in physics, chemistry and biology

1. *Interaction of high-power terahertz radiation with metallic films*
O. V. Chefonov¹, A. V. Ovchinnikov¹, S. I. Ashitkov¹, S. A. Evlashin², P. S. Kondratenko³, M. B. Agranat¹, V. E. Fortov¹
¹Joint Institute for High Temperatures of the RAS, Moscow, Russia,
²Center for Design, Manufacturing and Materials, Skolkovo Institute of Science and Technology, Moscow, Russia
³Nuclear Safety Institute of the RAS, Moscow, Russia
2. *Disappearance of Self-Focusing for Few-Cycle THz Pulses*
S.A. Kozlov¹, A.A. Drozdov¹, M. A. Kniazev¹, D.A. Kislin¹, S. Choudhary^{2,3}, R.W. Boyd^{2,3}
¹ITMO University, Saint-Petersburg, Russia
²University of Ottawa, Ottawa, Canada
³The Institute of Optics, University of Rochester, Rochester, USA
3. *Ultrafast multi-electron dynamics studied with THz-field streaking*
M. Krikunova^{1,2}, E. Klimešová¹, O. Kulyk¹, T. Oelze², B. Schütte³, T. Gebert⁴, J. Andreasson^{1,5}
¹ELI Beamlines, DolníBřežany by Prague, Czech Republic
²Technische Universität Berlin, Berlin, Germany
³Max-Born Institute, Berlin, Germany
⁴Max Planck Institute for the Structure and Dynamics of Matter, Hamburg, Germany
⁵Chalmers University of Technology, Göteborg, Schweden

4. *Experiments using extreme parameters of the NovoFEL radiation*
V. V. Kubarev^{1,2}, Ya. V. Getmanov^{1,2}, O. A. Shevchenko¹, E. N. Chesnokov³, P. V. Koshlyakov³, L. N. Krasnoperov⁴
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²Novosibirsk State University, Novosibirsk, Russia
³Voevodsky Institute of Chemical Kinetics and Combustion, Novosibirsk, Russia
⁴NJIT, New Jersey, USA
5. *Vector and mixed beams with orbital angular momentum*
N. D. Osintseva¹, Yu. Yu. Choporova^{1,2}, O. E. Kameshkov^{1,2}, B. A. Knyazev^{1,2}, V. S. Pavelyev³
¹Budker Institute of Nuclear Physics SB RAS, Novosibirsk, Russia
²Novosibirsk State University, Novosibirsk, Russia
³Samara National Research University, Samara, Russia
6. *Terahertz optical elements for control of high-power laser irradiation*
V.S. Pavelyev^{1,2}, A.N. Agafonov^{1,2}, B.O. Volodkin^{1,2}, K.N. Tukmakov^{1,2}, B.A. Knyazev^{3,4}, Yu.Yu. Choporova^{3,4}
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²Image Processing Systems Institute, RAS, Samara, Russia
³Budker Institute of Nuclear Physics of SB RAS, Novosibirsk, Russia
⁴Novosibirsk State University, Novosibirsk, Russia
7. *Nonlinear Transfer of Intense Few Cycle Terahertz Pulse Through Opaque Semiconductors*
O. V. Chefonov¹, A. V. Ovchinnikov¹, M. B. Agranat¹, V. E. Fortov¹, E. S. Efimenko², A. N. Stepanov², T.Ozaki³, X.Chai³, X.Ropagnol³, A.A.Ushakov⁴ and A.B. Savel'ev⁴
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²Institute of Applied Physics of the RAS, Nizhny Novgorod, Russia
³INRS-EMT, Advanced Laser Light Source, INRS, Varennes, Canada
⁴Lomonosov Moscow State University, Moscow, Russia
8. *Relaxation of Coulomb States in Semiconductors Probed by FEL Radiation*
R.Kh. Zhukavin¹, K.A. Kovalevsky¹, V.V. Tsyplenkov¹, S.G. Pavlov², H-W. Hübers^{2,3}, Yu.Yu. Choporova^{4,5}, B.A. Knyazev^{4,5}, J.M. Klopff⁶, B. Redlich⁷, N.V. Abrosimov⁸, Yu.A. Astrov⁹, V.N. Shastin¹
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³Department of Physics, Humboldt-Universität zu Berlin, Berlin, Germany
⁴Budker Institute of Nuclear Physics, Novosibirsk, Russia
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⁷FELIX Laboratory, Radboud University, Institute of Molecules and Materials, Nijmegen, The Netherlands

- ⁸Leibniz Institute of Crystal Growth, Berlin, Germany
⁹Ioffe Institute, St. Petersburg, Russia
9. *Terahertz induced magnetization dynamics in a weak ferromagnet FeBO₃*
E.A. Mashkovich¹, K. Grishunin^{1,2}, R.V. Mikhaylovskiy¹, P. Christianen³, Th. Rasing¹, A.V. Kimel^{1,2}
¹Radboud University, Nijmegen, Netherlands
²Moscow Technological University (MIREA), Moscow, Russia
³High field magnetic laboratory, Nijmegen, Netherlands
10. *Challenges of Raman scattering at THz frequencies*
S. G. Pavlov¹, N. Deßmann², N. V. Abrosimov³, R. Kh. Zhukavin⁴, V. N. Shastin⁴, H.-W. Hübers^{1,2}
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³Leibniz Institute of Crystal Growth, Berlin, Germany
⁴Institute for Physics of Microstructures, Nizhny Novgorod, Russia

S8. Terahertz & microwave imaging: tomography, holography and near-field microscopy

1. *Generation of vortex beamlet lattices via diffraction of Bessel vortex beams on 2D hole arrays: analytical and numerical calculations and comparison with experiments*
O. E. Kameshkov^{1,2}, B. A. Knyazev^{1,2}, I.A. Kotelnikov^{1,2}
¹Budker Institute of Nuclear Physics of Siberian Branch RAS, Novosibirsk, Russia
²Physics Department, Novosibirsk State University, Novosibirsk, Russia
2. *Diagnostic value of microwave imaging of dielectric tissues properties in patients with Dupuytren disease*
A. K. Martusevich¹, A.G. Galka^{1,2}, S.Yu. Krasnova¹, S.V. Petrov¹, A.V. Novikov¹
¹Privolzhsky Research Medical University, Nizhny Novgorod, Russia
²Institute of applied Physics, Nizhny Novgorod, Russia
3. *Comparative study of dielectric properties of the skin of human and laboratory animals*
A. K. Martusevich¹, A.G. Galka^{1,2}, S.Yu. Krasnova¹, D.V. Yanin^{1,2}, A.V. Kostrov¹
¹Privolzhsky Research Medical University, Nizhny Novgorod, Russia
²Institute of applied Physics, Nizhny Novgorod, Russia
4. *Microwave imaging of skin damage at experimental burns*
A. K. Martusevich¹, A.G. Galka^{1,2}, S.Yu. Krasnova¹, A.G. Soloveva¹
¹Privolzhsky Research Medical University, Nizhny Novgorod, Russia
²Institute of applied Physics, Nizhny Novgorod, Russia
5. *Subsurface diagnostics of quasi-one-dimensional inhomogeneities using the method of near-field microwave sounding*
D. V. Yanin, A. G. Galka, A. V. Kostrov, A.I. Smirnov
 Institute of Applied Physics of the RAS Nizhny Novgorod, Russia

6. *Investigation of electrodynamic parameters of biological tissues*
D. V. Yanin¹, A. G. Galka¹, A. V. Kostrov¹, V.E.Zagainov², S.A.Vasenin²
¹Federal Research Center Institute of Applied Physics of the RAS (IAP RAS), Nizhny Novgorod, Russian Federation
²Privolzhsky Federal Medical Centre Roszdrava, Nizhny Novgorod, Russian Federation
7. *Impact of Scattering in Quasi-Ordered Structures on THz Imaging*
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S9. Systems of security and non-destructive control using THz and MW radiation. Remote sensing with THz radiation. Communication in THz frequency range

1. *Influence of pollution and extraneous inclusions on the scattering of THz radiation by fabric*
A. A. Angeluts, V. N. Aksenov, A. V. Balakin, I. A. Ozheredov, A. P. Shkurinov
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2. *Svalbard astroclimate research: expedition and first results*
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3. *Microstructured sapphire shaped crystals for anitiresonant and bandgap terahertz waveguiding*
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4. *Investigation of the influence of the location on the rate of Sub THz space communications channels*
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5. *Detection and Identification of a Substance with an Inhomogeneous Surface Using the Effective Time-Dependent THz Spectroscopy Method and Emission*

Frequency Up-Conversion

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6. *Using a Gyrotron as a Source of Modulated Radiation for Data Transmission Systems in the Terahertz Range*

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7. *Two-phonon scheme of generating soft terahertz radiation by gold nanobars for detection of hidden objects*

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8. *Submillimeter wave Tomography and image processing advances: Applications to additive manufacturing quality control*

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9. *The concept of construction of inspection systems based on quantum-cascade lasers*

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10. *Measuring the topological charge of vortices with diffraction and interference techniques*

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11. *Devices and system based on quantum semiconductor superlattices for the frequency range 0.1-10 THz*

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S10. Medical and biological applications of THz radiation

1. *Application of high resolution subTHz spectroscopy methods for analyzing the content of grain odors*

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2. *Definition of thresholds of the heating effects of THz radiation on cancer cells*

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3. *Study of blood and its components by terahertz pulsed spectroscopy*

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4. *Morphological analysis of microglia in early postischemic period in the mouse local cerebral ischemia*

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5. *The research method of a qualitative analysis of the composition of the blood in the terahertz frequency range*

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6. *Applications of THz laser spectroscopy and machine learning for medical diagnostics*

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7. *Spectroscopy of solutions in the low frequency extended THz frequency range*

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8. *Application of THz radiation for in situ control of eye cornea hydration level*
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9. *A device to inspect a skin cancer tumour in the terahertz range, transferring the image into the infrared*
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10. *THz absorption spectra of glucose and its polymers*
A. V. Semenova¹, Yu.S. Guseva^{1,2}, V.L. Vaks^{1,2}, A.N. Panin¹, D.A. Babarina², S.S. Morunova³, A.S. Vilkov³
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11. *Interaction of terahertz radiation with tissue phantoms: numerical and experimental studies*
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12. *High resolution terahertz spectroscopy for medical, biological and agricultural applications*
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13. *High-power Microwaves Against Locusts and Other Harmful Animals*
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14. *Compact DNP polarizer for MRI applications at 1.5 T*
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³Comprehensive Heart Failure Center, University Hospital, Würzburg, Germany
15. *Overhauser DNP applications at 9.4 Tesla by using terahertz irradiation*
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16. *Biomedical applications of terahertz solid immersion microscopy*
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17. *Study of biochemical and hemostasiological parameters under the influence of low-intensity microwave noise radiation*
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18. *THz time-domain spectroscopy for non-invasive assessment of water content in biological samples*
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19. *Nonthermal impact of terahertz radiation on living systems*
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20. *Study of PVC-based Skin Phantom with graphite particles in Terahertz Frequency Range*

- T.Zhang¹, P.S. Demchenko¹, A.P. Popov^{1,2}, I.V. Meglinski^{1,2}, A.V. Bykov^{1,2}, M.K. Khodzitsky¹**
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21. *The mechanism of the effect of microwave radiation on the parameters of homeostasis in living systems*
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22. *Investigation of interaction of THz radiation with blood components*
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23. *The influence of terahertz radiation on biochemical metabolism of blood in the experiment*
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24. *Intraoperative diagnosis of malignant brain gliomas using terahertz pulsed spectroscopy and optical coherence tomography*
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2. *Terahertz and mm-wave applications at ENEA-Frascati*
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 ENEA – Fusion Physics Division – Radiation Sources, Antennas and Diagnostics Laboratory Frascati – Italy
3. *From millimeter to microns – IAP RAS powerful sources for various applications*
M. Yu. Glyavin, G. G. Denisov, E.A. Khazanov
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4. *Ultrafast THz-pump & Electron-probe Facility (ci-rcus) at KAERI*
Young Uk Jeong^{1,2}, Nikolay Vinokurov³, Hyun Woo Kim^{1,2}, In Hyung Baek^{1,2}, Key Young Oang¹, Mi Hye Kim¹, Young Chan Kim¹, Kyu-Ha Jang^{1,2}, Kitae Lee^{1,2}, Seong Hee Park⁴, Sergey Miginsky^{1,3}, Jungwon Kim⁵, Fabian Rotermund⁵, Sunglae Cho⁶
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5. *Recent experiments at NovoFEL user stations*
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6. *Novosibirsk Free Electron Laser Facility*
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1. *THz science at FELBE*
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