

2010 International Conference on Advanced Optoelectronics and Lasers

(CAOL 2010)

**Sevastopol, Ukraine
10-14 September 2010**



IEEE Catalog Number: CFP10814-PRT
ISBN: 978-1-4244-7043-3

Contents

Plenary Papers

(Invited) Micro-/Nano-Photonic Device Structures Applied to Communications, Sensing and Consumer Optoelectronics R. M. De La Rue, A. Samarelli, D. Logan, A. Khokhar, R. Dylewicz, P.Velha, D. Macintyre, N. Johnson, F. Rahman, M. Sorel	1
(Invited) Optical Soliton Pulses with Relativistic Characteristics G. S. McDonald, J. M. Christian, T. F. Hodgkinson	4
(Invited) Trends and Challenges in Optical Packet Networking: The Network Layer Perspective M. Klinkowski, M. Jaworski, M. Marciniak	7
(Invited) Tunable Nonlinear Metamaterials and Plasmon Nanofocusing Y. Kivshar	12
(Invited) Strong Turbulence Analysis of Sinusoidal and Hyperbolic Gaussian Beams H. T. Eyyuboglu	15
(Invited) Evolution of Nanophotonics from Semiconductor Photonic Crystal Device to Metal/Semiconductor Plasmonic Device K. Asakawa, Y. Sugimoto, N. Ikeda, D. Tsuya, Y. Koide, Y. Watanabe, N. Ozaki, D. Kumar V., T. Nomura, D. Inoue, A. Miura, H. Fujikawa, K. Sato	18
(Invited) New Coupled Micro-Ring Resonator Structures and Laser Arrays P. Chamorro-Posada, F.J. Fraile-Pelaez	25
(Invited) Recent Progress on Deep-ultraviolet Coherent Light Sources Qinjun Peng, Zhimin Wang, Shenjin Zhang, Fengfeng Zhang, Feng Yang, Dafu Cui, Zuyan Xu.....	28
(Invited) Effective Mode Volume of a Natural Mode of an Open Dielectric Resonator with an Active Region A. I. Nosich, E. I. Smotrova, V. O. Byelobrov, T. M. Benson	33
(Invited) Pneumatic Photonic Crystals: Properties and Multiscale Indication of Pressure E.Ya. Glushko	36
(Invited) Non-Stationary Coherent Population Trapping in Frequency-Modulated Fields V. L.Derbov, A. S.Lyubimov	38
(Invited) Mechanisms of Holographic Recording in Photopolymers V.Obukhovskiy, T.Smirnova	40
 (Invited) Superradiant Heterolasers V. V. Kocharovskiy, M. A. Garasoyv, P. A. Kalinin, E. R. Kocharovskaya, A. A. Belyanin, V. V. Kocharovskiy	43
 (Invited) Selected Fundamental and Applied Problems of Laser mode Formation V.G. Niziev	46
 (Invited) Properties of the Interaction of Laser Radiation with a Gaseous Dust Medium A. F. Glova, A. Yu. Lysikov, M. M. Zverev	52
(Invited) Diffraction Feature and Applications of Holographic Bragg Gratings E. A.Tikhonov	55
(Invited) (110) Quantum Well Based Spin VCSELs H. Kawaguchi, S. Koh	58
(Invited) Dark Resonances in Rubidium Atoms Excited by Optical Comb A. M. Negriyko, R. A. Malitskiy, V. M. Khodakovskiy, V. I. Romanenko, I. V. Matsnev, L. P. Yatsenko	61
(Invited) 589 nm High Power Sum-Frequency Generation with Quasi-Continuous-Wave Diode-Pumped Nd:YAG Lasers Bo Yong, Xie Shiyong, Wang Zhichao, Shen Yu, Xu Jialin, Cui Dafu, Peng Qinjun, Xu Zuyan	64
(Invited) High Power Waveguide CO₂ Lasers for Technologies and Medicine V. Ya. Panchenko, V. S. Golubev, V. V. Vasiltsov, E.N.Egorov	67
(Invited) 3D Model of Vertical Cavity Surface Emitting Laser with Resonant Array of Quantum Wells and External Mirror N. N. Elkin, A. P. Napartovich, D. V. Vysotskiy	71
(Invited) Light Fields with Complex Polarization Structure V.G. Volostnikov, S.P. Kotova, O. Yu. Moiseev, A.V. Volkov, E.N. Vorontsov, D.M. Yakunenkov	74

(Invited) Shack-Hartmann Wavefront Sensor – Advantages and Disadvantages A. Kudryashov, V. Samarkin, A. Alexandrov, J. Sheldakova, V. Zavalova	76
--	----

Nonlinear Photonics

(Invited) Nonlinear Solitary Waves in Positive-Negative Refractive Media A. Maimistov	78
---	----

(Invited) Multipole Model for Metamaterial Homogenization A. Chipouline, J. Petschulat, C. Menzel, C. Rockstuhl, T. Pertsch, F. Lederer	81
---	----

(Invited) Nonlinear Coupling in Plasmonic Structures J. R. Salgueiro, Y.S.Kivshar	83
---	----

(Invited) Nonlinear Dynamics of Spiraling Laser Beams A. S. Desyatnikov	86
---	----

(Invited) Rotating Three-Dimensional Solitons S. Skupin, F. Maucher, W. Krolikowski	89
---	----

(Invited) Symmetry-Induced Forces on Phase Singularities A. Ferrando, M.A. García-March	92
---	----

(Invited) Optical Nanoprobing via Spin-Orbit Interaction of Light K. Y. Bliokh, O. Rodríguez-Herrera, D. Lara, E. A. Ostrovskaya, C. Dainty	95
---	----

Masses of Polaritons I. V. Dzedolik	97
---	----

Refraction of Grey Solitons at Defocusing Kerr Interfaces J. Sanchez-Curto, P. Chamorro-Posada, G.S. McDonald	100
---	-----

Localized States and Oscillations Induced by Coherent Interaction of Waves in Nonlocal Media S. Bugaychuk, R. Conte, E. Kozij, O. Kolesnyk, G. Klimusheva	103
---	-----

Soliton based DPSK Encoded Sequences: Stability and Dynamical Properties J. E. Prylepskiy, S. A. Derevyanko, S. K. Turitsyn	106
---	-----

Magneto-Optical Kerr Effect in a Dielectric Film with Cubic Optical Nonlinearity on a Magneto-Electric Slab Yu. S. Dadoenkova, I. L. Lyubchanskii, Y.P. Lee, Th.Rasing	109
--	-----

Direct Quantitative Estimation of the Spatial Energy Migration Between Ions Yb^{3+} in $Gd_3Ga_5O_{12}$ Matrix E. V. Ivakin, I. G. Kisialiou	112
--	-----

(Invited) Liquid Crystal Defects: Nonlinear Optics and Optical Vortices E. Brasselet	115
--	-----

(Invited) Nonlocal Interactions of Solitons in Bias-Free Nematic Liquid Crystals Ya. V. Izdebskaya	118
--	-----

(Invited) Reversible Optical Nonreciprocity in Periodic Structures with Liquid Crystals A. E. Miroshnichenko, E. Brasselet, Y. S. Kivshar	121
---	-----

Fast Near-Infrared CdHgTe:V:Mn Photorefractive Material for Optical and Biomedical Applications Y. P. Gnatenko, P. M. Bukivskij, Y. P. Piryatinski, I. O. Faryna, M. S. Fur'yer, O. A. Shigiltchoff, R. V. Gamernyk, N. Kukhtarev, and T. Kukhtareva	124
---	-----

Nonlinear LBO and BBO Crystals for Extreme Light Sources A. E. Kokh, T. B. Bekker, K. A. Kokh, N. G. Kononova, V. A. Vlezko, Ph. Villeval, S. Durst, D. Lupinski	127
---	-----

Laser Resonators and Beam Propagation

Kaleidoscope Laser Properties and New Optical Fractal Contexts J. M. Christian, G. S. McDonald, A. S. Heyes, J. G. Huang	130
--	-----

Modification of the Power Radiated by an Electrical Dipole in the Presence of a Thin Dielectric Disk M. V. Balaban, R. Sauleau, A. I. Nosich	133
--	-----

Adaptive Optical System with Water-Cooled Bimorph Deformable Mirror V.V.Samarkin, M.E.Dryagin, A.V.Kudryashov, P.N.Romanov	136
--	-----

A Theorem for the Propagation of Electromagnetic Waves Through a Multilayered Structure Consisting of Left Handed Material and Dielectric	
M. F. Ubeid, M. M. Shabat	137
Theoretical and Experimental Investigations Compact Slab Guide Resonators	
V.A. Saetchnikov, E. A. Tcheriavskaia	139
The Contribution of Evanescent Waves into the Power Transfer	
A.B. Katrich	141
Simulation of Lasing Modes in a Kite-Shaped Microcavity Laser	
E. I. Smotrova, A. I. Nosich	144
Space Confinement of Random Lasing	
V. P.Yashchuk, O. A. Prygodiuk	147
Fast Adaptive Optical System for Laser Beam Correction	
A.L.Rukosuev, A.G. Alexandrov, A.V.Kudryashov, V.V.Samarkin	150
Optimizing Energy Performance of «Zig-Zag» Slab Lasers in Form of Flat Truncated Prisms	
I. S. Manak, V. V. Zukowski, M. S. Leanenia	152
Microchip Laser with Active Output Mirror	
V. V. Kiyko, V. I. Kislov, E. N. Ofitserov	155
Hill-Climbing Algorithm for Adaptive Optical System with Shack-Hartmann Sensor	
J. Sheldakova, A. Rukosuev, P. Romanov, A. Kudryashov, V. Samarkin	157
Design of the Interference Structures Taking Into Account Absorption by Thin-Film Materials	
Ya. Bondarchuk, H. Petrovska	159
Resonance Oscillations in Quasiperiodic Layered Structures with Lumped Inhomogeneities	
V. F. Borulko, D. V. Sidorov	162
Disc and Microdisc Resonators with Strip-Like Diffraction Gratings	
O. I. Belous, A. I. Fisun, V. L. Pasynin	165
Spiral Resonators with Whispering Gallery-like Modes	
O. V. Goroshko, R. V. Golovashchenko, V. N. Derkach	167
Metal Waveguide Resonator with a Tilted Mirror	
A. V. Volodenko, O. V. Gurin, A. V. Degtyarev, V. A. Maslov, V. A. Svich, A. N. Topkov, T. F. Ruban	169
Optical Measurements	
Measurement of Linear Polarization of Laser Radiation with Two-Grating Thin-Wire Bolometer	
<u>V.M. Kuzmichov</u> , S.V. Pogorelov, B.V. Safronov, V.P. Balkashin, I.A. Priz	173
Novel Semiconductor Optical Amplifier with Tapered Active Channel	
Yu.O. Kostin, A.A. Lobintsov, S.D. Yakubovich	175
Effect of Laser Beam Shape on Differential-Phase Measurements	
Yu. V. Pilgun, E. N. Smirnov	177
The Relations Between the Basic Characteristics of Scattered Laser Irradiation Field and the Location Objects Surface Parameters	
Arakcheev P. V., Semerenko D. A., Maryanina A. S., Nazarov S. I., Buryi E. V.	179
Diagnostics of Laser Radiance Penetration into Material by Multi-Channel Pyrometer	
V. S. Golubev, A. V. Dubrov, Yu. N. Zavalov, V. D. Dubrov, N. G. Dubrovin	182
Optical Measurements of Ferroelastics (Cs₃Bi₂I₉): New Phenomena and Optical Devices	
F. V. Motsnyi	185
Optical Interferometry and Data Analysis of Laser-Produced Plasmas	
A. A. Aliverdiev, D. Batani, R. Dezulian, T. Vinci, A. Benuzzi-Mounaix, M. Koenig, V. Malka	188
Measuring Surface Distribution of Narrowband Radiation Wavelength by Colorimetric Method	
A. V. Kraiski, T. V. Mironova, T. T. Sultanov, V. A. Postnikov	191

Basing of the Television-Picture Generator Application for Distance Monitoring of Turbulent Atmosphere G. N. Dolya, A. N. Katunin, A. N. Bulay, E. S. Chudovskaja	193
Experimental Investigations of Influence of Additionally Induced Polarization of the Ground State of Atoms on Multiphoton Transitions I. I. Bondar', V. V. Suran	196
Influence of Semiconductor Photoreceiver Spectral Responsivity at Different Temperature on Optical Measurements A. V. Polyakov, M. A. Ksenofontov	199
Research of Bolometer Parameters of the Trellised Receiver of Laser Radiation Kokody N. G., Pak A. O., Safronov B. V., Balkashin V. P., Priz I. A., Perepechai M. P.	202
Measurement of Intensity Distribution of Radiation in a Laser Beam by Shear Mechanism N.G. Kokodiy, Li Zhenhua	205
Holographic Shack-Hartmann Wavefront Sensor D. V. Podanchuk, V. P. Dan'ko, M. M. Kotov	208
The Commercially Available Version of Shack-Hartmann Wavefront Sensor P. N. Romanov, V. E. Zavalova, A. V. Kudryashov, A. L. Rukosuev	211
High Intensity Laser Beam Wavefront Diagnostics and Correction at the Advanced Laser Light Source Facility A. Alexandrov, S. Fourmaux, J. C. Kieffer, A. Kudryashov, F. Martin, T. Ozaki, S. Payeur	213
Optical Investigation of InGaAsP/InP Double Heterostructure Wafers V. Rakovics	216
Determination of Active Region Overheating Temperature of GaN-based Light Emitting Diodes Promising for Laser Media Pumping E. V. Lutsenko, V. N. Pavlovskii, A. V. Danilchuk, M. V. Rzheutski, A. G. Vainilovich, V. Z. Zubialevich, A. V. Muravitskaya, G. P. Yablonskii	219
Locating the Waist of a Gaussian Laser Beam K. I. Muntean	222
High power laser beam position stabilization system by means of adaptive optics M. E. Dryagin, A.G. Alexandrov, P. N. Romanov, A. L. Rukosuev, V. V. Samarkin	225
Enhanced interferometric technique for nondestructive characterization of crystalline optical materials: automated express refractive index measurements I. D. Karbovnyk, N. A. Andrushchak, Ya.V. Bobitskii	226
 Lasers and Applications	
Photophysical, Photochemical and Lasing Properties of Dipyrrolylmethene Complexes in Solutions and Solid Matrices R. Kuznetsova, L. Samsonova, T. Kopylova, G. Mayer, O. Sikorskaya, Yu. Aksenova, N. Zulina, E. Antina, S. Yutanova, L. Antina, T. Pavich, K. Solovoyov, S. Arabei	228
Measurements and Modeling of Optical Distortions Relaxation in High Power Nd:Glass Lasers V. E. Zavalova, A. V. Kudryashov, A. L. Rukosuev	231
Application of Sm₂Ti₂O₇ in Technology of Mirrors for He-Ne Laser V. F. Zinchenko, V. I. Maksimenko, V. P. Sobol', L. V. Sadkovska, Ye. V. Timukhin	233
Modeling of XeCl Excilamps, Taking Into Account of Process of Halogen Regeneration S. S. Anufrik, A. P. Volodenkov, K. F. Znosko	236
XeCl-Excilamp with the Capacitance Discharge S. S. Anufrik, A. P. Volodenkov, K. F. Znosko	239
Point of Care Fiber Optical Sensor for Non-Invasive Multi Parameter Monitoring of Blood and Human Tissue Biochemistry V. A. Saetchnikov, E. A. Tcheriavskaia, G. Schweiger	242
The Damage of DNA Induced by UV Nanosecond Laser Excitation at 193 nm N. N. Vtyurina, S. L. Grokhovski, I. V. Filimonov, O. I. Medvedkov, D. Yu. Nechipurenko, S. A. Vasiliev, Yu. D. Nechipurenko	244
Real Time Monitoring of Micro and Nano Particles, Blood Phantoms in Situ by Optical Micro Resonance Methods V. A. Saetchnikov, E. A. Tcheriavskaia, G. Schweiger, A. Ostendorf	247

The Phenomenon of Laser-Induced Photodissociation of Hemoglobin Complexes in Cutaneous Blood Vessels and its Biomedical Application	
M. M. Asimov	249
Some Problems of Modelling Processes of Relaxed Optics in the Regime of Saturation the Excitation	
P. P. Trokhimchuck	252
Laser-Microwave Spectroscopy of Au I Atoms in F Rydberg State	
S. F. Dyubko, V. A. Efremov, <u>V. G. Gerasimov</u> , M. N. Efimenko, M. P. Perepechay, K. B. MacAdam	255
Holographic Sensors of Glucose in Model Solution and Serum	
V. A. Postnikov, A. V. Kraiski, T. T. Sultanov, V. V. Deniskin	257
Thermosensor Diagnostics (TSD) of Laser Welding Process	
A. F. Keremzhanov , P. P. Arkhipov, A. G. Lazarenko	259
About the Influence of Metallic Additives On Copper Vapor Laser Output Parameters	
E. A. Svitlichniy, V. A. Kelman, Yu. V. Zhmenyak, V. V. Zvenihorodskiy, Yu. O. Shpenik	262
Influence of InGaN/GaN/Si Electroluminescent Heterostructure Design and Quantum Well Thickness on their Luminescent and Laser Properties	
V. N. Pavlovskii, E. V. Lutsenko, A. V. Danilchuk, V. Z. Zubialevich, A. V. Muravitskaya, G. P. Yablonskii, H. Kalisch, R. H. Jansen, B. Schineller, M. Heuken	265
Modelling of THz-Laser Radiation Pulse Shape	
V. K. Kiseliov, V. P. Radionov	268
Reparative Regeneration Processes of Thyroid Gland and Timus at Experimental Autoimmune Thyroiditis after Laserotherapy	
I. Gopkalova, V. Dubovik	270