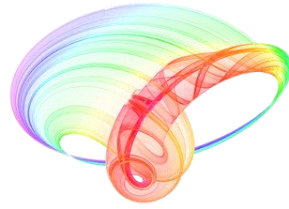


Book of abstracts



PHOTONICA2017

The Sixth International School and Conference on Photonics

& COST actions: MP1406 and MP1402



&H2020-MSCA-RISE-2015 CARDIALLY workshop



28 August – 1 September 2017

Belgrade, Serbia

Editors

Marina Lekić and Aleksandar Krmpot

Institute of Physics Belgrade, Serbia

Belgrade, 2017

ABSTRACTS OF TUTORIAL, KEYNOTE, INVITED LECTURES,
PROGRESS REPORTS AND CONTRIBUTED PAPERS

of

The Sixth International School and Conference on Photonics
PHOTONICA2017

28 August – 1 September 2017
Belgrade Serbia

Editors

Marina Lekić and Aleksandar Krmpot

Technical assistance

Marko Nikolić and Danica Pavlović

Publisher

Institute of Physics Belgrade
Pregrevica 118
11080 Belgrade, Serbia

Printed by

Serbian Academy of Sciences and Arts

Number of copies

300

ISBN 978-86-82441-46-5

PHOTONICA 2017 (The Sixth International School and Conference on Photonica - www.photonica.ac.rs) is organized by Institute of Physics Belgrade, University of Belgrade (www.ipb.ac.rs), Serbian Academy of Sciences and Arts (www.sanu.ac.rs), and Optical Society of Serbia (www.ods.org.rs).



Other institution that helped the organization of this event are: Vinča Institute of Nuclear Sciences, University of Belgrade (www.vinca.rs), Faculty of Electrical Engineering, University of Belgrade (www.etf.bg.ac.rs), Institute of Chemistry, Technology and Metallurgy, University of Belgrade (www.ihtm.bg.ac.rs), Faculty of Technical Sciences, University of Novi Sad (www.ftn.uns.ac.rs), Faculty of Physics, University of Belgrade (www.ff.bg.ac.rs), and Faculty of Biology, University of Belgrade (www.bio.bg.ac.rs).

PHOTONICA 2017 is organized under auspices and with support of the Ministry of Education, Science and Technological Development, Serbia (www.mpn.gov.rs). PHOTONICA 2017 is supported and recognized by The Integrated Initiative of European Laser Research Infrastructures LaserLab-Europe (www.laserlab-europe.eu) and European Physical Society (www.eps.org).



The support of the sponsors of PHOTONICA 2017 is gratefully acknowledged:



Committees

Scientific Committee

Aleksandar Krmpot, Serbia
Antun Balaž, Serbia
Arlene D. Wilson-Gordon, Israel
Bojan Resan, Switzerland
Boris Malomed, Israel
Branislav Jelenković, Serbia
Dejan Gvozdić, Serbia
Detlef Kip, Germany
Dragan Indjin, United Kingdom
Edik Rafailov, United Kingdom
Feng Chen, China
Francesco Cataliotti, Italy
Giannis Zacharakis, Greece
Goran Isić, Serbia
Goran Mašanović, United Kingdom
Isabelle Philippa Staude, Germany
Jelena Radovanović, Serbia
Jerker Widengren, Sweden
Jovana Petrović, Serbia
Laurent Sanchez, France
Ljupčo Hadžievski, Serbia
Marco Santagiustina, Italy
Milan Mashanović, United States of America
Milan Trtica, Serbia
Miloš Živanov, Serbia
Milutin Stepić, Serbia
Milivoj Belić, Qatar
Nikola Stojanović, Germany
Pavle Andus, Serbia
Peđa Mihailović, Serbia
Radoš Gajić, Serbia
Schaaf Peter, Germany
Sergei Turitsyn, United Kingdom
Suzana Petrović, Serbia
Ticijana Ban, Croatia
Vladana Vukojević, Sweden
Zoran Jakšić, Serbia
Željko Šljivančanin, Serbia

Organizing Committee

Aleksandar Krmpot, (Chair)
Marina Lekić (Secretary)
Stanko Nikolić (webmaster)
Marko Nikolić,
Vladimir Veljić
Danica Pavlović

Technical Organizer



Dear Colleagues, friends of photonics,

We are honored by your participation at our PHOTONICA 2017 and your contribution to the tradition of this event. It is our pleasure to host you in Belgrade and in Serbia. Welcome to the world of photonics.

The International School and Conference on Photonics- PHOTONICA, is a biennial event held in Belgrade since 2007. The first meeting in the series was called ISCOM (International School and Conference on Optics and Optical Materials), but it was later renamed to PHOTONICA to reflect more clearly the aims of the event as a forum for education of young scientists, exchanging new knowledge and ideas, and fostering collaboration between scientists working within emerging areas of photonic science and technology. A particular educational feature of the program is to enable students and young researchers to benefit from the event, by providing introductory lectures preceding most recent results in many topics covered by the regular talks. In other words, tutorial and keynote speakers will give lectures specifically designed for students and scientists starting in this field. Apart from the oral presentations PHOTONICA hosts vibrant poster sessions. A significant number of best posters will be selected and the authors will have opportunity to present their work through short oral presentations – contributed talks.

The wish of the organizers is to provide a platform for discussing new developments and concepts within various disciplines of photonics, by bringing together researchers from academia, government and industrial laboratories for scientific interaction, the showcasing of new results in the relevant fields and debate on future trends.

This PHOTONICA 2017 will include two COST Action meetings and one workshop with the main objective to promote knowledge in various disciplines of photonics. In addition, the representatives of the companies related to photonics will have significant role at the event by presenting the new trends in research and development sector.

Following the official program, the participants will also have plenty of opportunities to mix and network outside of the lecture theatre with planned free time and social events. Participating in the social program of PHOTONICA 2017, visiting the attractions of Belgrade like the Nikola Tesla museum or simply walking around the city center, the participants will have opportunity to meet Belgrade and Serbia and to learn useful facts about culture and history of the region.

This book contains 216 abstracts of all presentations at the VI International School and Conference on Photonics, PHOTONICA2017. Authors from all around the world, from all the continents, will present their work at this event. There will be five tutorial and seven keynote lectures to the benefits of students and early stage researches. The most recent results in various research fields of photonics will be presented through twenty one invited lectures and nine progress reports of early stage researchers. Within the two poster sessions and a number of contributed talks, authors will present 174 their new results in a cozy atmosphere of the building of Serbian Academy of Science and Arts.

Belgrade, July 2017

Editors

PHOTONICA 2017 Timetable (Serbian Academy of Sciences and Arts - Main Hall)

Monday, August 28 th	Tuesday, August 29 th	Wednesday, August 30 th	Thursday, August 31 st	Friday, September 1 st
08.00-17.00 Registration	08.00-17.00 Registration	08.00-12.00 Registration	08.00-12.00 Registration	
08.30-09.00 Opening				
09.00-09.35 Krolikowski	09.00-09.35 Chichkov	09.00-09.35 Zalevsky	09.00-09.35 Weis	09.00 – 09.45 Pernice
09.35-09.45 Discussion break	09.35-09.45 Discussion break	09.35-09.45 Discussion break	09.35-09.45 Discussion break	
09.45-10.20 Krolikowski	09.45-10.20 Chichkov	09.45-10.20 Zalevsky	09.45-10.20 Weis	09.45– 10.30 Belić
10.20-10.40 Coffee break	10.20-10.40 Coffee break	10.20-10.40 Coffee break	10.20-10.40 Coffee break	10.30 – 10.50 Coffee break
10.40-11.25 Hingerl	10.40-11.25 Jerker	10.40-11.25 Kralj	10.40-11.25 Adhikari	10.50 – 11.35 Barry
11.25-11.35 Discussion break	11.25-11.35 Discussion break	11.25-11.35 Discussion break	11.25-11.35 Discussion break	
11.35-12.05 Pasiskevicius	11.35-12.05 Jakovcevski	11.35-12.05 Artemyev	11.35-12.05 Pelster	11.35-11.45 Discussion break
12.05-12.35 Fratalochi	12.05-12.35 Štrancar	12.05-12.35 Teichert	12.05-12.35 Salasnich	11.45 - 12.15 Leisher
12.35-14.30 LUNCH BREAK	12.35-14.30 LUNCH BREAK	12.35-14.30 LUNCH BREAK	12.35-14.30 LUNCH BREAK	12.15 - 12.45 Gerharth
				12.45-14.30 LUNCH BREAK
14.30-15.05 Radić	14.30-15.00 Luning	14.30-15.00 Rakich	14.30-15.00 Loew	14.30-15.00 van Oosten
15.05-15.10 Discussion break	15.00-15.30 Dučić	15.00-15.30 Baronio	15.00-15.30 Affolderbach	15.00-15.30 Zamfiresku
15.10-15.45 Radić				
15.45-16.00 CT1	15.30-15.45 CT3	15.30-16.00 Setzpfandt	15.30-15.45 CT6	15.30-15.45 CT8
	15.45-16.00 CT4		15.45-16.00 CT7	15.45-16.00 CT9
16.00-16.20 Coffee break	16.00-16.20 Coffee break	18.00 – 20.00 Excursion (boat trip and sightseeing from Belgrade rivers)	16.00-16.20 Coffee break	16.00-16.20 Coffee break
16.20-16.50 Slavik	16.20-16.50 Borzsonyi		16.30 – 18.30 Posters & Industrial talks	16.20-16.50 Longo
16.50-17.10 Tarasov	16.50-17.10 Krešić			16.50-17.10 Stupar
17.10-17.30 Chernysheva	17.10-17.30 Mladenović			17.10-17.30 Bajić
17.30-17.50 Popovic	17.30-17.50 Ralević			17.30-17.50 Obradov
17.50-18.05 CT2	17.50-18.05 CT5			17.50 -18.05 CT10
				18.05-18.20 CT11
18.30 -20.00 Cocktail	18.15 – 20.00 Posters &Industrial talks			
			20.00 ---- Conference dinner (bohemian quarter Skadarlija)	

Tutorial lecture	2x35 min	Keynote lecture	45 min	Invited lecture	30 min	Special invited lecture	30 min	Progress report	20 min	Contributed talk -CT	15 min
---------------------	-------------	--------------------	-----------	--------------------	-----------	-------------------------------	-----------	--------------------	-----------	-------------------------	-----------

Conference Topics

1. Quantum optics and ultracold systems
2. Nonlinear optics
3. Optical materials
4. Biophotonics
5. Devices and components
6. Optical communications
7. Laser spectroscopy and metrology
8. Ultrafast optical phenomena
9. Laser - material interaction
10. Optical metamaterials and plasmonics
11. Other topics in photonics

Table of Contents

Tutorial lectures

T.1	A fully algebraic approach to magneto-optical effect in atoms:.....2 Lecture 1: "Stokes parameters, atomic multipole moments and their interaction" Lecture 2: "Atom light interactions in the presence of magnetic fields" <i>Antoine Weis</i>
T.2	Lecture 1: "3D laser printing of polymers, nanoparticles, and living cells"3 Lecture 2: "3D laser printing of polymers, nanoparticles, and living cells" <i>Boris Chichkov</i>
T.3	Beyond the myth of nonlinear capacity limits in fiber optic transmission.....4 <i>S. Radic and N. Alic</i>
T.4	Self-organization of light in media with competing nonlocal nonlinearities.....5 <i>F. Maucher, T.Poh, S.Skupin and W.Krolikowski</i>
T.5	Translation of remote photons based sensing into virtual tactile and hearing senses.....6 <i>Yevgeny Beiderman, Yafim Beiderman, Sergey Agdarov and Zeev Zalevsky</i>

Keynote lectures

K.1	Ultrasensitive and ultrahigh resolution fluorescence spectroscopy and imaging for fundamental biomolecular studies and towards clinical diagnostics.....8 <i>Jerker Widengren</i>
K.2	A classical model for depolarization by temporal and spatial decoherence.....9 <i>Kurt Hingerl</i>
K.3	Developing high capacity fibre transmission systems employing spectrally efficient super-channel technology.....10 <i>Vidak Vujicic, Cosimo Calò, Colin Browning, Kamel Merghem, Anthony Marlinez, Abderrahim Ramdane, Liam P Barry</i>
K.4	In situ visual observation of 2D materials growth and modifications, and characterization of their optical properties.....11 <i>Marko Kralj</i>
K.5	Rogue waves, Talbot carpets and accelerating beams.....12 <i>M.R. Belic, S. Nikolic, O. Ashour, and Y.Q. Zhang</i>
K.6	All-optical processing using phase-change nanophotonics.....13 <i>Wolfram Pernice</i>
K.7	Three-dimensional "solitons" in Bose-Einstein condensates and nonlinear optics.....14 <i>Sadhan K. Adhikari</i>

Invited lectures

I.1	Metal free structural colors via disordered nanostructures with nm resolution and full CYMK color spectrum.....16 <i>V. Mazzone, M. Bonifazi and A. Fratalocchi</i>
I.2	Two Intriguing Examples for Topological Effects in Ultracold Atoms.....17 <i>Axel Pelster</i>

I.3	Organic crystalline nanoneedles on 2D materials and their optoelectronic properties.....	18
	<i>Christian Teichert</i>	
I.4	Precision measurements for compact vapor-cell atomic clocks.....	19
	<i>C. Affolderbach, M. Gharavipour, F. Gruet, W. Moreno, M. Pellaton, and G. Mileti</i>	
I.5	Time-resolved studies of femtosecond laser surface ablation of dielectrics and Semiconductors(in air).....	20
	<i>Dries van Oosten</i>	
I.6	Dark Line, Lump and X-solitary Waves in Optical Media.....	21
	<i>F. Baronio and S. Wabnitz</i>	
I.7	Spontaneous parametric down-conversion in periodically structured media.....	22
	<i>Frank Setzpfandt</i>	
I.8	Confocal synaptology - a simple method for the assessment of synaptic re-arrangements in neurodegenerative disorders and upon nervous system injury.....	23
	<i>Igor Jakovcevski</i>	
I.9	Single Photons: Hong-Ou-Mandel Experiments and beyond.....	24
	<i>Mohammad Rezaei, Jörg Wrachtrup and Ilja Gerhardt</i>	
I.10	Probing Ultrafast Magnetization Dynamics with Resonant X-ray Scattering Techniques.....	25
	<i>Jan Luning</i>	
I.11	Lipid wrapping as a molecular initiating event in nanotoxicology through fluorescence microspectroscopy and super-resolution microscopy.....	26
	<i>I. Urbančič, M. Garvas, B. Kokot, H. Majaron, P. Umek, M. Škarabot, F. Schneider, S. Galiani, Z. Arsov, T. Koklič, A. Mertelj, I. Mušević, C. Eggeling and J. Štrancar</i>	
I.12	Bright solitons in ultracold atoms.....	27
	<i>Luca Salasnich</i>	
I.13	Applications of 3D laser lithography.....	28
	<i>M. Zamfirescu, B. Calin, F. Jipa and Irina Paun</i>	
I.14	Optical properties of 2D colloidal semiconductor quantum wells and hybrid structures.....	29
	<i>Mikhail Artemyev</i>	
I.15	Advancements in high efficiency semiconductor lasers for high power applications.....	30
	<i>Paul O. Leisher</i>	
I.16	Stimulated Brillouin Scattering in Silicon Photonics.....	31
	<i>Peter Rakich</i>	
I.17	Signal Propagation Time through Hollow-Core Fibres and its Low Sensitivity to Temperature.....	32
	<i>R. Slavík, E. Numkam Fokoua, M. N. Petrovich, N. V. Wheeler, T. Bradley, F. Poletti, and D.J. Richardson</i>	
I.18	Hot Rydberg atoms and more.....	33
	<i>Robert Löw</i>	
I.19	Synchrotron light based spectro-microscopies: illumination of cellular disorders in neuro-degenerative diseases.....	34
	<i>Tanja Dučić</i>	
I.20	Backward-wave optical parametric interactions in structured nonlinear media.....	35
	<i>V. Pasiskevicius, C. Canalias, A. Zukauskas</i>	

Special invited lecture

S.1	Research opportunities within LaserLab Europe and ELI.....	36
	<i>Adam Borzsonyi</i>	

Progress reports

P.1	Development and application of an electronic sensing system by using polymer optical fibre with sensitive zone.....	38
	<i>D. Stupar, J. Bajić and M. Živanov</i>	
P.2	Frequency comb cooling of rubidium atoms.....	39
	<i>N. Šantić, I. Krešić, A. Cipriš, T. Ban and D. Aumiler</i>	
P.3	Low cost optical sensors for absolute rotary position measurement.....	40
	<i>Jovan S. Bajić, Dragan Z. Stupar, Ana Joža, Branislav Batinić, Nikola Laković, Miloš B. Živanov</i>	
P.4	Mid-infrared fibre laser sources and their application for vibrational spectroscopy.....	41
	<i>Maria Chernysheva</i>	
P.5	Photoacoustic response of an transmission photoacoustic configuration for two-layer samples with thermal memory.....	42
	<i>M.N. Popovic, M. Nesic, D. Markushev, M. Zivanov, S. Galovic</i>	
P.6	Electronic Properties of Interfaces between Domains in Organic Semiconductors.....	43
	<i>M. Mladenovic and N. Vukmirovic</i>	
P.7	Plasmonics for infrared detectors.....	44
	<i>Marko Obradov</i>	
P.8	Instabilities in nonlinear systems.....	45
	<i>N. Tarasov, A. M. Perego and S. K. Turitsyn</i>	
P.9	Surface enhanced Raman spectroscopy of thiocyanine coated silver nanoparticle clusters.....	46
	<i>U. Ralević, G. Isić, B. Laban, D. Vasić Aničijević, V. Vodnik, U. Bogdanović, V. Vasić, V. M. Lazović and R. Gajić</i>	

1. Quantum optics and ultracold systems

Q.O.1	Ultraslow propagation of optical pulses in hot potassium vapor.....	48
	<i>B. Zlatković, A. J. Krmpot, D. Arsenović, I. S. Radojičić, M. M. Ćurčić, Z. Nikitović, and B. M. Jelenković</i>	
Q.O.2	Parallel solvers for dipolar Gross-Pitaevskii equation.....	49
	<i>V. Lončar, D. Vudragović, S. K. Adhikari, and A. Balaž</i>	
Q.O.3	Effect of conduction band Non-parabolicity on the intersubband transitions in ZnO/Mg _x Zn _{1-x} O Quantum Well Heterostructures.....	50
	<i>Y. Chrafić, L. Moudou, K. Rahmani, I. Zorkani</i>	
Q.O.4	Deformation of the Fermi Surface.....	51
	<i>Vladimir Veljić, Antun Balaž and Axel Pelster</i>	
Q.O.5	Transport dynamics in optical lattices with flux.....	52
	<i>A. Hudomal, I. Vasić, H. Buljan, W. Hofstetter, and A. Balaž</i>	
Q.O.6	Quantum phase gate based on quantum Zeno dynamics.....	53
	<i>H. V. Do, C. Lovecchio, S. Gherardini, M. Muller, F. Caruso and F. S. Cataliotti</i>	
Q.O.7	Open-Dissipative Gross-Pitaevski Approach to Photon BEC Dynamics.....	54
	<i>Enrico Stein, Axel Pelster</i>	
Q.O.8	Excitation spectra of a Bose-Einstein condensate with an angular spin-orbit coupling.....	55
	<i>I. Vasić and A. Balaž</i>	
Q.O.9	A distinguishable single excited-impurity in a Bose-Einstein condensate.....	56
	<i>Javed Akram</i>	
Q.O.10	Photonic simulation of open quantum systems with various exchange statistics.....	57
	<i>Milan Radonjić and Philip Walther</i>	

Q.O.11	Electromagnetically induced transparency in degenerate 3-level ladder-type system.....	58
	<i>Lj. Stevanović, N. Filipović and V. Pavlović</i>	
Q.O.12	Husimi function for time-frequency analysis in optical, microwave and plasmonics applications.....	59
	<i>Milena D Davidović, Miloš D Davidović, Ljubica D Davidović, Vladimir A Andreev, Dragomir M Davidović</i>	
 2. Nonlinear optics		
N.O.1	Quasi-stable rotating solitons supported by a single spiral waveguide.....	60
	<i>Aleksandra I. Strinić, Milan S. Petrović, Najdan B. Aleksić and Milivoj R. Belić</i>	
N.O.2	Routing of optical beams by asymmetric defects in (non)linear waveguide arrays.....	61
	<i>M. Stojanović Krasić, S. Jovanović, A. Mančić and M. Stepić</i>	
N.O.3	Four wave mixing in potassium vapor with off-resonant double lambda system.....	62
	<i>D. Arsenović, M. M. Ćurčić, B. Zlatković, A. J. Krmpot, I. S. Radojičić, T. Khalifa and B. M. Jelenković</i>	
N.O.4	Towards the fully developed statistical approach of vector rogue waves.....	63
	<i>A. Mančić, A. Maluckov, F. Baronio, Lj. Hadzievski, S. Wabnitz</i>	
N.O.5	Signatures of non-quenched disorder in the wave pattern's spreading in flat band geometries.....	64
	<i>G. Gligorić, A. Maluckov</i>	
N.O.6	Molecules in a bicircular strong laser field.....	65
	<i>D. Habibović, A. Čerkić, M. Busuladžić, A. Gazibegović-Busuladžić, S. Odžak, E. Hasović, and D. B. Milošević</i>	
N.O.7	Enhanced second harmonic generation in lithium niobate photonic crystal cavities.....	66
	<i>Reinhard Geiss, Séverine Diziain, Michael Steinert and Thomas Pertsch</i>	
N.O.8	Solitons generated by self-organization in bismuth germanium oxide single crystals during the interaction with laser beam.....	67
	<i>V. Skarka, M. Lekić, A. Kovačević, B. Zarkov, and N. Z. Romčević</i>	
N.O.9	Broad-band femtosecond pulses, λ^3 type diffraction and X-waves. Evolution and management.....	68
	<i>V. Slavchev, A. Dakova, D. Dakova, K. Kovachev and L. Kovachev</i>	
N.O.10	Sum frequency conversion of compact Q-switched cryogenic slab RF discharge CO laser radiation in nonlinear ZnGeP ₂ crystal.....	69
	<i>A. Ionin, I. Kinyaevskiy, Yu. Klimachev, Yu. Kochetkov, A. Kozlov, L.V. Seleznev, D. Sinitsyn, D. Zemtsov</i>	
N.O.11	Realizing aperiodic photonic lattices by synthesized Mathieu-Gauss beams.....	70
	<i>J. M. Vasiljević, Alessandro Zannotti, D. V. Timotijević, Cornelia Denz, D. M. Jović Savić</i>	
N.O.12	Measurement of powerful ultrashort UV pulse parameters.....	71
	<i>A.A. Ionin, D.V. Mokrousova, D.A. Piterimov, L.V. Seleznev, A.V. Shutov, E.S. Sunchugasheva, N.N. Ustinovskii, V.D. Zvorykin</i>	
N.O.13	Polarization properties of vector solitons in optical fibers.....	72
	<i>A. Dakova, L. Kovachev, D. Dakova, D. Georgieva and V. Slavchev</i>	
N.O.14	Optical-Terahertz Solitons.....	73
	<i>A.N. Bugay and S.V. Sazonov</i>	
N.O.15	Vortices and topological structures in photorefractive materials.....	74
	<i>M. Čubrović and M. Petrović</i>	
N.O.16	Exact traveling and solitary wave solutions to the generalized Gross-Pitaevskii equation with cylindrical potential.....	75
	<i>Nikola Z. Petrović</i>	
N.O.17	Nonlinear Fourier analysis of a mode-locked laser.....	76

	<i>M. Kamalian, A. M. Perego, J. Prilepsky and S. K. Turitsyn</i>	
N.O.18	Nonlinear light scattering and nonlinear absorption in photorefractive LiNbO ₃ crystals studied by Z-scan technique.....	77
	<i>S.M. Kostritskii, M. Aillerie, E. Kokanyan, O.G. Sevostyanov</i>	
N.O.19	Gain analysis for fiber optical parametric amplifier in presence of attenuation and dispersion fluctuations.....	78
	<i>M. S. Kovacevic, Lj. Kuzmanovic, and A. Djordjevich</i>	
N.O.20	Analytical and dynamical generation of higher-order solitons and breathers of the extended nonlinear Schrödinger equation on different backgrounds.....	79
	<i>S. N. Nikolić, Najdan B. Aleksić, Omar A. Ashour, Milivoj R. Belić, Siu A. Chin</i>	
3.	Optical materials	
O.M.1	Enhancing conductivity of self-assembled transparent graphene films with UV/Ozone Treatment.....	80
	<i>T. Tomasević-Ilić, D. Jovanović, J. Pešić, A. Matković, M. Spasenović, R. Gajić</i>	
O.M.2	One-step synthesis of NIR-responsive NaYF ₄ :Yb,Er@Chitosane nanoparticles for biomedical application.....	81
	<i>I. Dinic, A. Djukic-Vukovic, L. Mojovic, M.G. Nikolic, M.D. Rabasovic, A.J. Krmpot, O. Milosevic and L. Mancic</i>	
O.M.3	Defect detection in aluminum using pulse thermography for a sample width periodic structure.....	82
	<i>V. Damnjanović, Lj. Tomić, G. Dikić, B. Milanović and S. Petričević</i>	
O.M.4	Rare-earth enabled silicon light emitting diodes for the near-infrared.....	83
	<i>M. A. Lourenço and K. P. Homewood</i>	
O.M.5	Band edge modified rare-earth doped silicon for efficient mid-infrared photodetectors.....	84
	<i>K. P. Homewood and M. A. Lourenço</i>	
O.M.6	Selection of optical polymers in lens design.....	85
	<i>N. Sultanova, S. Kasarova, I. Nikolov and R. Kasarov</i>	
O.M.7	Photoluminescence spectroscopy of CdSe nanoparticles embedded in transparent glass.....	86
	<i>M. Gilić, R. Kostić, D. Stojanović, M. Romčević, B. Hadžić, Z. Lazarević, J. Trajić, J. Ristić-Đurović, N. Romčević</i>	
O.M.8	Improved thermal and mechanical properties of tot'hema–gelatin eco-friendly films.....	87
	<i>B. Muric, D. Pantelic, D. Vasiljevic and B. Jelenkovic</i>	
O.M.9	Ab-initio calculations of electronic and vibrational properties of Sr and Yb-intercalated grapheme.....	88
	<i>A. Šolajić, J. Pešić and R. Gajić</i>	
O.M.10	Influence of x-ray irradiation on the dielectric properties of YbF ₃ -doped (Ba/Ca)F ₂ crystals.....	89
	<i>M. Stef and I. Nicoara</i>	
O.M.11	Bifurcation in reflection spectra of holographic pullulan diffraction grating.....	90
	<i>S. Savić-Šević, D. Pantelić, V. Damljanović and B. Jelenković</i>	
O.M.12	Discrete and Selective Absorption in Crystalline Molecular Nanofilms.....	91
	<i>M. Vojnović, A.J. Šetrajčić – Tomić, S.M. Vučenović, J.P. Šetrajčić</i>	
O.M.13	Optical properties of atomic layer deposition prepared Al-doped ZnO for photonic applications.....	92
	<i>N. Bojinov, V. Marinova and D. Z. Dimitrov</i>	
O.M.14	An example of two-dimensional crystal structure with semi-Dirac electronic dispersion.....	93
	<i>V. Damljanović and R. Gajić</i>	
O.M.15	Ab-initio study of optical properties of MoS ₂ and WS ₂ compared to spectroscopic results of liquid phase exfoliated nanoflakes.....	94

	<i>Jelena Pešić, Jasna Vujin, Tijana Tomašević-Ilić, Marko Spasenović Radoš Gajić</i>	
O.M.16	Nanostructured films based on Au nanocrystals of different morphology for SERS.....	95
	<i>T.H. Beinyk, N.A. Matveevskaya, S.V. Dukarov</i>	
O.M.17	Self-polarization effects in spherical core-shell quantum dot.....	96
	<i>D. Stojanović, R. Kostić</i>	
O.M.18	Sb- based phase- change materials.....	97
	<i>D. Z. Dimitrov</i>	
O.M.19	Electronic and optical properties of square HgTe quantum dots.....	98
	<i>D. B. Topalović, V. V. Arsoški, N. A. Čukarić, M. Ž. Tadić and F. M. Peeters</i>	
O.M.20	Polarization holographic gratings with high diffraction efficiency recorded in azopolymer PAZO.....	99
	<i>L. Nedelchev, D. Ivanov, N. Berberova and D. Nazarova</i>	
O.M.21	Optical and microstructural characterization of NiO:K.....	100
	<i>P. Petkova, A. Boukhachem, P. Vasilev and V. Altonyan</i>	
O.M.22	Luminescence thermometry using Gd ₂ Zr ₂ O ₇ :Eu ³⁺	101
	<i>M.G. Nikolic, M.S. Rabasovic, J. Krizan, S. Savic-Sevic, M.D. Rabasovic, B.P. Marinkovic, A. Vlastic and D. Sevic</i>	

4. Biophotonics

B.1	Using infrared radiation for the measurement of arterial blood flow waveform.....	102
	<i>B. Stojadinović, Z. Nestorović, D. Žikić</i>	
B.2	Study on relationship between amyloid- β peptides and metal ions via two-photon excitation fluorescence microscopy.....	103
	<i>S. Jovanić, N. Loncarevic, M. Rabasovic, A. Krmpot, M. Jovic, S. Kanazir, and B. Jelenkovic</i>	
B.3	Two-photon excited hemoglobin fluorescence for <i>ex vivo</i> microscopy analysis of erythrocytes at single cell level.....	104
	<i>I. T. Drvenica, A. Stančić, S. Jovanić, V. Lj. Ilić, M. D. Rabasović, D. V. Pantelić, B. M. Jelenković, B.M. Bugarski, A. J. Krmpot</i>	
B.4	Feasibility study of TPEF, SHG & CFM for soft tissue neoplasia analysis.....	105
	<i>Ts. Genova, E. Borisova, G. Stanciu, D. Tranca, O. Semyachkina-Glushkovskaya, D. Gorin, I.Terziev</i>	
B.5	Phycomyces blakesleeanus hypha cell wall surgery by Ti: Sapphire laser.....	106
	<i>T.Pajic, K.Stevanovic, N. Todorovic, A. Krmpot, M. Rabasovic, V. Lazovic, D. Pantelic, B. Jelenkovic⁴ and M. Zivic</i>	
B.6	Peculiarities of cw laser beam imaging of contrasting small-depth inclusions in highly-scattering media.....	107
	<i>T. Dreischuh, L. Gurdev, O. Vankov, E. Toncheva, L. Avramov, D. Stoyanov</i>	
B.7	Compact lasers for innovative non-invasive biomedical research and diagnostics.....	108
	<i>Karina S. Litvinova, Sergei G. Sokolovski, Edik U. Rafailov</i>	
B.8	Study of acute complications of diabetes mellitus type II by Raman spectroscopy.....	109
	<i>M.Miletic, S.Askrabic, D. Popovic, M.Djordjevic, I. Mrdovic and Z. Dohcevic-Mitrovic</i>	
B.9	Synchrotron based X-ray microscopy for the verification of trace metals and SOD1 protein aggregates in intact astrocytes from arat model of amyotrophic lateral sclerosis.....	110
	<i>S. Stamenković, B. Lai, P. Andjus and T. Dučić</i>	
B.10	Light controllable TiO ₂ -Ru nanocomposite system encapsulated in small unilamellar vesicles for anti-cancer photodynamic therapy.....	111
	<i>M. Matijević, M. Nešić, I. Popović, M. Stepić, M. Radoičić, Z. Šaponjić and M. Petković</i>	
B.11	Application of multiparametric cardiac measurement system in ejection fraction calculation.....	112
	<i>Marjan Miletić, Marija D. Ivanović, Lana Popović Maneski, Boško Bojović</i>	

B.12	Nonlinear microscopy as a novel method for studying insect morphology.....	113
	<i>D. Pavlović, D. Pantelić, A. Krmpot, M. Rabasović, V. Lazović, M. Vrbica, S. Čurčić</i>	
B.13	Confocal image analysis of immunohistochemistry of connexin isoforms during the second trimester of gestation of the human fetal brain development.....	114
	<i>Dušica Kočović, Mandakini B. Singh, Jasmina Tadić, Svetlana Vrzić-Petronijević, Pavle R. Andjus and Srdjan D. Antic</i>	
B.14	Combined photoacoustic and optical microscopy for the detailed description of ciliary body anatomy.....	115
	<i>George J. Tservelakis, Stella Avtzi, Miltiadis K. Tsilimbaris, and Giannis Zacharakis</i>	
B.15	Analysis of human healthy dentin microstructure by using two photon excitation fluorescence microscopy and second harmonic generation.....	116
	<i>Tijana Lainović, Mihailo Rabasović, Larisa Blažić, Dejan Pantelić, Aleksandar Krmpot, Vladimir Lazović, Branislav Jelenković</i>	
B.16	Second harmonic generation imaging of collagen fibers in the uninvolved human rectal mucosa 10 cm and 20 cm away from the malignant tumor.....	117
	<i>Sanja Despotović, Ivana Lalić, Novica Milićević, Živana Milićević, Mihailo Rabasović, Dejan Pantelić, Svetlana Jovanić and Aleksandar Krmpot</i>	
B.17	Voltage-Sensitive Dye Imaging of Membrane Potential Transients in Thin Dendritic Branches of Cortical Pyramidal Neurons.....	118
	<i>Jesse A. White, Mandakini B. Singh and Srdjan D. Antic</i>	
B.18	Designing Multi-Functional Plasmonic Nanoparticles for Cancer Theranostics.....	119
	<i>E. D. Onal and K. Guven</i>	
B.19	Method of preparing biomedical samples for cancer detection by infrared spectroscopy.....	120
	<i>J. L. Ristić-Djurović, S. T. Ćirković, N. Paunović, J. T. Juloski, S. R. De Luka, V. M. Ćuk, M. Romčević, A. M. Trbovich and N. Romčević</i>	
B.20	Fetal Actometer Based on Optical Fibre Gratings.....	121
	<i>V. Atanasoski, M. Ivanovic, N. Stojanovic, Lj. Hadzievski and J. Petrovic</i>	
B.21	Time resolved luminescence spectra of greater celandine (<i>Chelidonium majus</i> L.).....	122
	<i>M. S. Rabasovic, D. Sevic, M. D. Rabasovic, M. G. Nikolic and B. P. Marinkovic</i>	
B.22	Quantitative characterization of receptor-receptor interactions in live cells using dual-color fluorescence cross-correlation spectroscopy.....	123
	<i>V. Radoi, A. A. Ghavanini, J. Rüegg, E. Kosek and V. Vukojevic</i>	
B.23	Effect of Size and Geometry of Quantum Dots on Performance of Time Resolved Fluorescence Spectroscopy; A Monte Carlo Study.....	124
	<i>Amid Rahi, Tahereh Tekieh, and Pezhman Sasanpour</i>	
B.24	Optimized Design of Intensity Based Plasmonic Fiber Biosensor; Modeling and Experiment.....	125
	<i>Mitra Abedini, Raheleh Mohammadpour, Mohsen Ahmadi, and Pezhman Sasanpour</i>	
B.25	The effect of short-term fish oil supplementation on Alzheimer disease-like pathology in 5xFAD mouse model.....	126
	<i>Milena Jović, Nataša Lončarević-Vasiljković, Desanka Milanović, Vladimir Avramović, Marjana Brkić, Selma Kanazir</i>	

5. Devices and components

D.C.1	A New Method for Multi-Bit and Qudit Transfer Based on Commensurate Waveguide Arrays.....	127
	<i>J. Krsic, P. Veerman and J. Petrovic</i>	
D.C.2	Digital holography of graphene oxide paper acoustic membranes.....	128
	<i>J. Mitrić, D. Abramović, D. Todorović, N. Demoli, M. Spasenović</i>	
D.C.3	Polarized Intensity Reduction of Red-Sea Glint Reflection.....	129

	<i>R. Avrahamy, B. Milgrom, S. Hava</i>	
D.C.4	Self-pulsing in monolithic and external cavity mid-IR QCLs.....	130
	<i>N. Vukovic, J. Radovanovic, V. Milanovic and D.L. Boiko</i>	
D.C.5	Eigenmode and frequency domain analysis of the third-order microring filters.....	131
	<i>M. Radmilović-Radjenović and B. Radjenović</i>	
D.C.6	Analysis of the transmission and tunneling time characteristics in light propagation through anisotropic media.....	132
	<i>N. Opacak, J. Radovanovic and V. Milanovic</i>	
D.C.7	3D finite element eigenmode analysis of coupling mode induced resonance frequency shift in coupled microring resonators.....	133
	<i>B. Radjenović, M. Radmilović-Radjenović and P. Beličev</i>	
D.C.8	Coupled-mode theory approximation of scattering parameters of antisymmetric structures.....	134
	<i>V. Milosevic and B. Jokanovic</i>	
D.C.9	Fabry-Pérot lasers with Al-containing quantum wells in the COBRA generic photonic integration platform.....	135
	<i>F. Lemaître, J. Decobert, H. Ambrosius, G. Binet, N. Lagay, R. Van Veldhoven, F. Pommereau and K. Williams</i>	
D.C.10	Terahertz narrowband transmission filters based on guided mode resonant metallic gratings.....	136
	<i>A. Ferraro, D. C. Zografopoulos, R. Caputo, and R. Beccherelli</i>	
D.C.11	Modeling of aircraft IC signature based on comparative tracking.....	137
	<i>D. Knežević, P. Matavulj and Z Nikolić</i>	
D.C.12	Graphene acoustic diaphragms.....	138
	<i>M. Spasenović, J. Mitrčić, D. Abramović, N. Demoli, D. Grujić, D. Pantelić, D. Todorović</i>	
D.C.13	Hybrid organic/inorganic devices for display applications.....	139
	<i>V. Marinova, Y.C. Su, C. C. Chiou, S. Petrov, Ch. Dikov, D. Dimitrov and S. H. Lin</i>	
D.C.14	Laser Fabrication of Diffractive Optical Elements for Two-dimensional Airy Beams.....	140
	<i>Bogdan – Ștefăniță Călin, Liliana Preda, Florin Jiipa, Marian Zamfirescu</i>	
D.C.15	Development of composite wavelength tunable interference wedged structures for laser technology, spectroscopy and optical communications.....	141
	<i>Marin Nenchev, Margarita Deneva and Elena Stoykova</i>	
D.C.16	Temperature Measurement with Ruby gauge.....	142
	<i>M. Nikolic, A. Vlasic and D. Lukic</i>	
D.C.17	Insight into different module options for the electro-absorption modulator.....	143
	<i>M. Trajkovic, F. Blache, H. Debregeas, K. Williams and X. Leijtens</i>	
D.C.18	Optimization of the cleaning properties of fog by means of an optical sensor for control of impurities in	144
	<i>O. Ivanov, P. Todorov, S. Markova, Y. Ralev, J. L. Pérez-Díaz</i>	
D.C.19	Systems for 2-dimensional laser scanning of solid surfaces.....	144
	<i>O. Ivanov, K. Pashev, P. Todorov, Y. Ralev, J. L. Pérez-Díaz, K. Balashev</i>	
6.	Optical communications	
O.C.1	Multiparameter QKD authentication protocol design over optical quantum channel.....	145
	<i>Nemanja Miljković, Aleksandar Stojanović, Rubens Viana Ramos, Petar Matavulj</i>	
O.C.2	Reconfigurable all-optical NAND/NOR logic gate based on dual injection-locked laser diodes.....	146
	<i>M. Lalović, A. Mičević, M. Krstić, J. Crnjanski, A. Totović and D. Gvozdić</i>	
O.C.3	Ultrahigh-speed hybrid VCSEL for short-distance optical interconnects.....	147
	<i>V. Topić, G. C. Park, S. Tandukar, L. Ottaviano and I.-S. Chung</i>	

O.C.4	Improving Quality of Service in four-channel WDM Ethernet Passive Optical Network.....	148
	<i>B. Pajčin, P. Matavulj and M. Radivojević</i>	
O.C.5	Quiescent points of self-seeded RSOA-FCL with Rayleigh backscattering feedback.....	149
	<i>A. Totović, J. Crnjanski, M. Krstić and D. Gvozdić</i>	
O.C.6	Estimation of Rayleigh scattering loss in a double clad photonic crystal fiber.....	150
	<i>M. S. Kovacevic, Lj. Kuzmanovic, and A. Djordjevich</i>	

7. Laser spectroscopy and metrology

L.S.M.1	Relaxation times of population and coherences in Rb vapor.....	151
	<i>Ivan S. Radojičić, Mohammadreza Gharavipour, Aleksandar J. Krmpot, Gaetano Mileti and Brana M. Jelenković</i>	
L.S.M.2	The new system for transferring units of temperature in the optical pyrometry in DMDM	152
	<i>Violeta Stankovic, Boban Zarkov, Slavica Simic</i>	
L.S.M.3	Evaluation of temporal scales of migration of cosmetic ingredients into the human skin by two-dimensional dynamic speckle analysis.....	153
	<i>E. Stoykova, B. Blagoeva, D. Nazarova, L. Nedelchev, T. Nikova, Y.M. Kim, H.J. Kang</i>	
L.S.M.4	The Global Network of Optical Magnetometers for Exotic physics searches.....	154
	<i>T. Scholtes, Z. Grujić, V. Lebedev and A. Weis</i>	
L.S.M.5	Light-shift in pulsed optically pumped Rubidium atomic clock.....	155
	<i>William Moreno, Matthieu Pellaton, Mohammadreza Gharavipour, Florian Gruet, Christoph Affolderbach and Gaetano Mileti</i>	
L.S.M.6	Improving the accuracy of cesium magnetometers.....	156
	<i>Z. D. Grujić, P. A. Koss, J. Piller, V. Lebedev, Y. Shi, V. Dolgovskiy, T. Scholtes, S. Colombo and A. Weis</i>	
L.S.M.7	Europium and Samarium dopant ions as luminescent sensors of Y ₂ O ₃ phase transitions under high pressure.....	157
	<i>Ana Vlašić, Mihailo Rabasović, Branka Murić, Vladan Čelebonović and Marko G. Nikolić</i>	
L.S.M.8	Excitation transfer from the Second to the First resonance line of Potassium observed in a hot atomic vapor.....	158
	<i>C. Andreeva, A. Krasteva, A. Markovski, S. Tsvetkov, S. Gateva, S. Gozzini, S. Cartaleva</i>	
L.S.M.9	H-alpha line broadening in diagnostics of pulsed laser plasma in aqueous aerosol.....	159
	<i>M. Momčilović, J. Ciganović, J. Savović, M. Stoiljković</i>	
L.S.M.10	Frequency-doubled laser sources stabilized to Rb-cell references.....	160
	<i>N. Almat, W. Moreno, M. Pellaton, F. Gruet, C. Affolderbach and G. Mileti</i>	
L.S.M.11	Retrieval of group refractive index in a dense atomic vapor helped by buffer gas-assisted radiation channeling.....	161
	<i>A. Papoyan, S. Shmavonyan, Davit Khachatryan and G. Grigoryan</i>	
L.S.M.12	Application of virtual instrumentation into the metrology system for optical thermometer calibration.....	162
	<i>Boban Zarkov, Slavica Simic</i>	

8. Ultrafast optical phenomena

U.O.1	Second order optical autocorrelator for measuring ultra short laser pulses duration.....	163
	<i>Andreja Vladković, Mihailo Rabasović, Torsten Golz, Nikola Stojanović, Dejan Pantelić, Branislav Jelenković, Aleksandar Krmpot</i>	
U.O.2	Origin of Space-separated Charges in Photoexcited Organic Heterojunctions on	

	Subpicosecond Time Scales.....	164
	<i>Veljko Janković and Nenad Vukmirović</i>	
U.O.3	High-harmonic generation in bulk diamond irradiated by intense ultrashort laser pulse.....	165
	<i>Tzveta Apostolova and Boyan Obreshkov</i>	
U.O.4	En route: single-shot THz characterization technique for THz beamline at FLASH1.....	166
	<i>R. Pan, E. Zapolnova, T. Golz, M. Rabasovic, A. Krmpot, A. Vladkovic, J. Petrovic, N. Stojanovic</i>	
U.O.5	Tunable High- field THz source at FLASH: Spectral and spatial characterization.....	167
	<i>E. Zapolnova, T. Golz, R. Pan, A. Vladkovic</i>	
U.O.6	Multiphoton imaging with blue-diode-pumped SESAM-modelocked Ti:Sapphireoscillator.....	168
	<i>B. Resan, A. Rohrbacher, O. E. Olarte, and P. Loza-Alvarez</i>	

9. Laser - material interaction

L.M.I.1	One Approach to Laser Scanning Problems for Improving Road Condition Diagnostics.....	169
	<i>N.Slavkovic, D.Mamula Tartalja and M.Bjelica</i>	
L.M.I.2	Photophoresis-based laser trapping with a line optical trap.....	170
	<i>A. Porfirev and S. Fomchenkov</i>	
L.M.I.3	Gold chloride cluster ions generated by vacuum laser ablation.....	171
	<i>Boris Rajčić, Silvana B. Dimitrijević, Marijana Petković, Marija Nišavić, Mario Cindrić, Filip Veljković and Suzana Veličković</i>	
L.M.I.4	Effect of the Corrected Ionization Potential on the High-Harmonic Generation transition rate in a linearly polarized laser field.....	172
	<i>Violeta Petrović, Hristina Delibašić, Kristina Isaković</i>	
L.M.I.5	Laser ablation of nickel/palladium multilayer thin films by nanosecond pulses.....	173
	<i>B. Salatić, S. Petrović, D.Peruško, I. Bogdanović-Radović, M. Čekada, P.Panjan, D.Pantelić and B. Jelenković</i>	
L.M.I.6	Effects of nanosecond laser pulses at 248 nm wavelength on multilayer CrN/(Cr,V)N coatings.....	174
	<i>B. Gaković, Suzana Petrović, P. Panjan, J. Kovač, V. Lazović, C. Ristoscu, I. Negut and I. N. Mihailescu</i>	
L.M.I.7	A Laser-based Fabrication Method of Carbonized Polyimide Surfaces for Flexible Devices.....	175
	<i>Yong-Won Maand Bo Sung Shin</i>	
L.M.I.8	Tungsten modification induced by femtosecond laser with 10^{14} W/cm ² intensity in vacuum.....	176
	<i>M. Trtica, J. Stasic, J. Limpouch, P. Gavrilov</i>	
L.M.I.9	Laser-induced periodic structure on Ti and Ti/Al thin films for photocatalytic application.....	177
	<i>D. Pjević, D. Peruško, E. Skoulas, E. Stratakis, Z. Siketić, I. Bogdanović-Radović, T. Savić, M. Čomor, S. Petrović</i>	
L.M.I.10	Calculation of populations of energy levels of sodium interacting with an intense laser pulse and estimation of the resonant dynamic Stark shift.....	178
	<i>A. Bunjac, D. B. Popović and N. S. Simonović</i>	
L.M.I.11	Inducing periodic structures on multilayers of Ti and Ta by femtosecond laser beam.....	179
	<i>Aleksander G. Kovačević, Suzana M. Petrović, Davor Peruško, Vladimir Lazović, Iva Bogdanović-Radović, Vladimir Pavlović, Dejan Pantelić, Branislav M. Jelenković</i>	
L.M.I.12	Micro-structured biopolymer scaffolds fabricated by femtosecond laser ablation.....	180
	<i>A. Daskalova, I. Bliznakova, P. Loukakos, A. Zhelyazkova, E. Kijeńska and C. Fotakis</i>	
L.M.I.13	Laser parameters optimization for the artifacts silver coated surfaces cleaning.....	181
	<i>B. Radojkovic, S. Ristic, S. Polic, B. Jegdic and M. Janicijevic</i>	

L.M.I.14 Laser induced mixing in multilayered Ti/Ta thin film structures.....	182
<i>Marko Obradović, Janez Kovač, Suzana Petrović, Vladimir Lazović, Branislav Salatić, Jovan Ciganović, Dejan Pjević, Momir Milosavljević, Davor Peruško</i>	
L.M.I.15 Energy distribution of ejected photoelectrons in K ⁻² V process.....	183
<i>Kristina Isaković, Violeta Petrović, Hristina Delibašić</i>	

10. Optical metamaterials and plasmonics

O.M.P.1 Extending useful spectrum of solar radiation in dye-sensitized solar cells using stochastic surface reliefs in plasmonic materials.....	184
<i>K. Cvetanović Zobenica, Z. Jakšić, M. Obradov, D. Vasiljević Radović, D. Stanisavljev</i>	
O.M.P.2 Influence of graphene and two-dimensional materials on electromagnetic enhancement in silver nanoparticle clusters.....	185
<i>U. Ralević, A. Panarin and G. Isić</i>	
O.M.P.3 Analysis of layer interactions between stacked metasurfaces.....	186
<i>J. Sperrhake, M. Falkner, S. Fasold and T. Pertsch</i>	
O.M.P.4 Spontaneous emission into Tamm plasmon modes on semi-infinite metallodielectric superlattices.....	187
<i>G. Isić, Z. Jakšić, S. Vuković</i>	
O.M.P.5 Influence of a resonance on delay times in terahertz chiral metamaterial slab.....	188
<i>D. B. Stojanović, P. P. Beličev, G. Gligorić, J. Radovanović, V. Milanović, Lj. Hadžievski</i>	
O.M.P.6 Photoemission Electron Microscopy of Airy Surface Plasmon Polaritons.....	189
<i>A. V. Singh, M. Falkner, M. Steinert, C. Menzel and T. Pertsch</i>	
O.M.P.7 Electromagnetic wave propagation through chiral metamaterials composed of twisted closed ring resonators.....	190
<i>D. B. Stojanović, P. P. Beličev, G. Gligorić, Lj. Hadžievski</i>	
O.M.P.8 Metal layers with subwavelength texturing for broadband enhancement of processes in photocatalytic microreactors.....	191
<i>M. Rašljić, Z. Jakšić, Ž. Lazić, M. Obradov, D. Vasiljević Radović, Ž. Čupić, D. Stanisavljev</i>	
O.M.P.9 Optical modulation using gain-assisted metasurfaces.....	192
<i>B. Vasić and R. Gajić</i>	
O.M.P.10 Film-coupled silver nanoparticles on flat and periodically corrugated aluminium substrates.....	193
<i>G. Isić, U. Ralević, S. Aškriabić, S. Graovac, S. Savić-Šević, A. Mikhailov, A. Antanovich, A. Prudnikau, M. Artemyev, I. Fabijanić, V. Janicki, B. Okorn, J. Sancho-Parramon and R. Gajić</i>	
O.M.P.11 Refractive index fluctuations due to multianalyte adsorption in chemical and biological plasmonic sensors of ultralow analyte concentrations.....	194
<i>O. Jakšić, I. Jokić, Z. Jakšić, M. Frantlović, M. Rašljić and K. Cvetanović Zobenica</i>	
O.M.P.12 Controlling silver nanoparticle production by ion-reduction process for tailoring of plasmonic properties.....	195
<i>I. Fabijanić, V. Janicki, B. Okorn, J. Sancho Parramon</i>	
O.M.P.13 Resonant absorption and extrinsic chirality in GaAs-based nanowires.....	196
<i>E. Petronijević, G. Leahu, A. Belardini, M. Centini, R. Li Voti, T. Hakkarainen, E. Koivusalo, M. Rizzo Piton, S. Suomalainen, M. Guina and C. Sibilica</i>	
O.M.P.14 Open Triangular Ring Cavity Resonator Integrating a Nanograting Mirror.....	197
<i>G. Ehrlich, M. Zohar, M. Auslender and S. Hava</i>	
O.M.P.15 All-dielectric metamaterials based on water. Experimental confirmation of the toroidal response.....	198
<i>Ivan Stenishchev, Alexey Basharin</i>	

O.M.P.16 Subwavelength nickel-copper multilayers as an alternative plasmonic material.....	199
<i>Ivana Mladenović, Zoran Jakšić, Marko Obradov, Slobodan Vuković, Goran Isić, Dragan Tanasković, Jelena Lamovec</i>	
O.M.P.17 Nontrivial nonradiating all-dielectric anapole sources.....	200
<i>Nikita A. Nemkov, Ivan V. Stenishchev, Alexey A Basharin</i>	
O.M.P.18 Metamaterials with broken symmetry: general approach, experiment and multipolar decomposition.....	201
<i>Anar K. Ospanova and Alexey A. Basharin</i>	
O.M.P.19 Titanium nitride plasmonic resonator Fabry-Perot for Raman lasing on nanoscale.....	202
<i>A. V. Kharitonov, S. S. Kharintsev and M. Kh. Salakhov</i>	
O.M.P.20 Phase and amplitude tunability in planar THz metamaterials with toroidal response.....	203
<i>Maria V. Cojocari, Kristina Schegoleva, Alexey A. Basharin</i>	
O.M.P.21 Laser induced ultrafast switching processes in diamond.....	204
<i>T. Apostolova and B. Obreshkov</i>	
O.M.P.22 Plasmonic Transmission Gratings for biosensors and atomic physics.....	205
<i>A. Sierant, B. Jany, D. Bartoszek-Bober, J. Fiutowski, J. Adam and T. Kawalec</i>	
O.M.P.23 Flat lenses with continuously graded metamaterials designed using transformation optics: anexact analytical solution of field equations.....	206
<i>M. Dalarsson, R. Mittra and Z. Jakšić</i>	

11. Other topics in photonics

O.P.1 Fresnel diffraction of a Laguerre-Gaussian $LG(l,n)$ laser beam by a combination of a fork-shaped grating and an axicon.....	207
<i>S. Topuzoski</i>	
O.P.2 Manipulation of the topological charges of vortices within large optical vortex lattices: Far-field beam reshaping.....	208
<i>L. Stoyanov, G. Maleshkov, I. Stefanov, A. Dreischuh</i>	
O.P.3 Characterization of liquid-phase epitaxy grown thick GaInAs (Sb)N layers.....	209
<i>V Donchev, I Asenova, M Milanova, D Alonso-Álvarez, K Kirilov, N Shtinkov, I G Ivanov, S Georgiev, E Valcheva and N Ekins-Daukes</i>	
O.P.4 Vertical Raman LIDAR profiling of atmospheric aerosol optical properties over Belgrade.....	210
<i>Z. Mijić, L. Ilić and M. Kuzmanoski</i>	
O.P.5 Planar versus three-dimensional growth of metal nanostructures at 2D heterostructures.....	211
<i>S. Stavrić, M. Belić, Ž. Šljivančanin</i>	
O.P.6 <i>Ab initio</i> study of superconducting properties of $NbSe_2$ monolayer in the DFPT formalism using Wannier interpolation.....	212
<i>Tatjana Agatonović Jovin and Radoš Gajić</i>	
O.P.7 Characterization of magnetron sputtered transparent hole conducting layers for organic solar cells.....	213
<i>M. Sendova-Vassileva, R. Gergova, Hr. Dikov, G. Popkirov, V. Gancheva and G. Grancharov</i>	
O.P.8 Post-processing synchronization and characterization of generated signals by a repetitive Marx generator.....	214
<i>A. Redjimi, Z. Nikolić, D. Knežević and D. Vasiljević</i>	
O.P.9 Cryogenic slab CO laser with RF discharge pumping: sealed-off plasma chemistry of the active medium.....	215
<i>A.A. Ionin, I.V. Kochetov, A.Yu. Kozlov, A.K. Kurnosov, A.P. Napartovich, L.V. Seleznev, D.V. Sinitsyn</i>	
O.P.10 Organic Nanocrystals for Quantum Nanophotonic Applications.....	216

	<i>S.Pazzagli, P. Lombardi, F. S. Cataliotti, C. Toninelli</i>	
O.P.11	Density Matrix Superoperator for Terahertz Quantum Cascade Lasers.....	217
	<i>A. Demić, A. Grier, Z. Ikonić, A. Valavanis, R. Mohandas, L. Li, E. Linfield, A. G. Davies and D. Indjin</i>	
O.P.12	Fluorescence of bio-molecules a simple and quick method: What honey emission speaks about bee society and honey quality.....	218
	<i>M. Stanković, D. Bartolić, B. Šikoparija, D. Spasojević, D. Mutavdžić, M. Natić and K. Radotić</i>	
O.P.13	Tuning exciton and trion population in MoS ₂ with photodoping.....	219
	<i>V. Jadriško, N. Vujičić, D. Čapeta and M. Kralj</i>	
O.P.14	Trajectory based interpretation of the laser light diffraction on a sharp edge	220
	<i>Milena D Davidović, Miloš D Davidović, Angel S Sanz, Mirjana Božić, Darko Vasiljević</i>	

Electromagnetic wave propagation through chiral metamaterials composed of twisted closed ring resonators

D. B. Stojanović^{1,2}, P. P. Beličev¹, G. Gligorić¹, Lj. Hadžievski¹

¹ *Vinča Institute of Nuclear Sciences,*

University of Belgrade, Serbia

² *School of Electrical Engineering,*

University of Belgrade, Serbia

e-mail:dankas@vin.bg.ac.rs

Chiral metamaterial consists of periodically placed resonant elements exhibiting chiral effects such as circular dichroism and optical activity. They appear due to the coupling of electric and magnetic fields which is result of an interaction of electromagnetic wave and chiral metamaterial. Numerous designs of chiral resonant elements are proposed providing applications for polarization conversion, filtering and absorption in THz frequency range [1, 2].

Here, we analyze propagation of electromagnetic waves through chiral metamaterial composed of twisted closed ring resonators (TCRR). The proposed chiral metamaterial is ultrathin structure which makes this design easy to fabricate and, at the same time, maintains effects which can be observed in conventional chiral 3D metamaterial structures. Dimensions of chiral elements are chosen to provide resonances within THz frequency range. Different geometrical parameters are varied in order to determine their influence on resonant frequency and losses [3].

For our TCRR chiral metamaterial structure, the analysis is made from microscopic as well as from macroscopic point of view. Through numerical simulations, we calculate electromagnetic field distribution, scattering coefficients, absorption and consequently, circular dichroism. Additionally, we examine losses in our chiral structure in terms of radiative and non-radiative ones [4] and explore its influence on the circular dichroism.

REFERENCES

- [1] G. Kenanakis, E. N. Economou, C. M. Soukoulis, M. Kafesaki, EPJ Appl. Metamat. 2, 1-12 (2016).
- [2] T. Kan et al., Nat. Commun. 6, 8422 (2015).
- [3] L. Solymar, E. Shamonina, Waves in metamaterials, Oxford (2009).
- [4] A. B. Khanikaev et al., Nat. Commun. 7, 12045 (2016).