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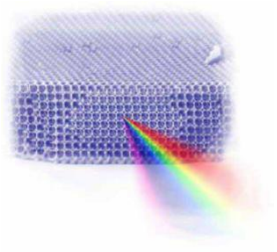
Kopaonik, March 12-15, 2023



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16th Photonics Workshop

(Conference)

16th Photonics Workshop (2023)

Book of abstracts

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Conference program

Sunday, March 12th

Chairman: Branislav Jelenković

16.00 – 16.30	**Registration & opening**
16.30 - 17.00	**Goran Mashanovich** *Mid-Infrared Silicon Photonics for Sensing*
17.00 - 17.20	**Bratislav Marinković** *"Photoelectron" Spectroscopy by Electron Impact: Scattered and Ejected Electrons*
17.20 – 17.40	**Danka Stojanović** *Data enrichment and calibration for PM 2.5 low-cost optical sensors*
17.40 – 18.00	**Dušan Božanić** *Valence Band Electronic Structure of Azobenzene-Functionalized Gold Nanoparticles*
18.00 – 18.15	**Duška Popović** *Analysis of the photoelectron energy spectra at resonant two-photon ionization of hydrogen atom by intense short laser pulses*
18.15 – 18.30	**Vladimir Damljanović** *Atlas of electronic band structures in two-dimensional materials*

Monday, March 13th

Chairman: Zoran Grujić

16.00 - 16.30	***Refreshment***
16.30 - 17.00	**Ferruccio Renzoni** *Electromagnetic Induction Imaging with Atomic Magnetometers: Pushing the Boundaries*
17.00 - 17.20	**Vladimir Đoković** *Gold-riboflavin hybrid nanostrucutures as possible photodynamic therapy agents*
17.20 – 17.40	**Nikola Stojanović** *Femtosecond laser spectroscopy for Exploration of Space*
17.40 – 17.55	**Merve Ekmekçioğlu** *Properties of Multilayer ZTO/Ag/ZTO Thin Film Electrodes Deposited by Magnetron Sputtering*
17.55 – 18.10	**Petar Atanasijević** *Thermoelectric temperature control of Morpho butterfly wings used for radiation sensing*
18.10 – 18.25	**Miloš Davidović** *Combining size distribution spectrums of ambient aerosols using equivalent optical properties of nanosized particles – selected examples from the Bay of Kotor*

Chairman: Bratislav Marinković

20.00 - 20.30	**Robert Loew** *Making hot atoms interact*
20.30 - 20.50	**Predrag Tadić** *Photoplethysmogram as a source of biomarkers for AI-based diagnosis of heart failure*
20.50 - 21.10	**Gulnur Aygun Ozyuzer** *The Effect of ZTO Interlayer Between LCO and LLZO Used in All Solid State Batteries*
21.10 - 21.25	**Mirjana Stojanović** *Localized modes in linear flux dressed two-dimensional plus lattice*
21.25 – 21.40	**Nataša Bon** *The Investigation of The Central Activity and Stellar Population Parameters in Active Galactic Nuclei*
21.40 – 22.00	**Edi Bon** *Spectroscopic modeling of supermassive binary black hole orbits in active galactic nuclei*
22.00 – 22.15	**Aleksander Kovačević** *Beam modification during propagation through aqueous microalgae suspension of interest to waveguiding*

Tuesday, March 14th

Chairman: Ljupčo Hadžievski

16.00 - 16.30	***Refreshment***
16.30 - 17.00	**Vladan Vuletić** *Quantum Simulation and Computation with Neutral Atoms*
17.00 - 17.20	**Branislav Jelenković** *Squeezed light by FWM in alkali vapor – generation and application*
17.20 – 17.40	**Caterina Credi** *Straightforward integration of SERS technology within novel opto-fluidic devices for rapid liquids probing with high sensitivity*
17.40 – 18.00	**Sara Nocentini** *Temperature-controlled polymer nanopatterning for 4D tunable photonics*
18.00 – 18.15	**Jovana Petrović** *Ultra-low-loss broadband multiport optical splitters*
18.15 – 18.35	**Mehtap Ozdemir** *Optimization of Large Area Thin Films for All Solid State Electrochromic Devices*

Chairman: Ivana Drvenica

20.00 - 20.30	**Srdjan Antic** *The Role of Physics in Modern Neuroscience*
20.30 - 20.50	**Ljiljana Nikolić** *Application of optogenetics for studying neuronal activity via glial photostimulation*
20.50 - 21.05	**Katarina Milićević** *In vitro testing of genetically encoded voltage indicator ArcLightD for recording spontaneous electrical activity of cortical neurons*
21.05 – 21.25	**Dejan Pantelić** *Thermal radiation imaging of insects using lockin techniques*
21.25 – 21.40	**Vladimir Atanasoski** *Autocorrelation for denoising biomedical signals*
21.40 – 21.55	**Kolja Bugarski** *Localized modes in SSH photonic lattice in the presence of defects and local nonlinearity*
21.55 – 22.15	**Dragan Lukić** *Proposal for a new surveillance system for military vehicles and a new crew arrangement*

Wednesday, March 15th

Chairman: Dušan Božanić

16.00 - 16.30	***Refreshment***
16.30 - 17.00	**Lutfi Ozyuzer** *Chiral Devices for Terahertz Waves Based on Tunable Metamaterials*
17.00 - 17.20	**Yasemin Demirhan** *Terahertz Metamaterials and Multispectral Terahertz Plasmonic Detectors*
17.20 – 17.40	**Željko Šljivančanin** *Computational modeling of magnetism induced in nonmagnetic 2D materials*
17.40 – 17.55	**Nurcin Karadeniz** *The Characterizations of Thin Film Filters for Far UVC 222 nm Excimer Lamps*
17.55 – 18.10	**Milica Nedić** *Impact of the vortex distortion phase on the efficiency of lasing zero-mode*
18.10 – 18.25	**Nikola Vuković** *Modeling of optical properties of novel terahertz photonics quantum well heterostructures*

Chairman: Aleksander Kovačević

20.00 - 20.20	**Zoran Grujić** *Heading error of Free Alignment Precession optically pumped magnetometer*
20.20 - 20.40	**Theo Scholtes** *A compact pump-probe optically pumped magnetometer system with different valence state*
20.40 - 20.55	**Jonas Hinkel** *Optically pumped magnetometer aiming for highest accuracy*
20.55 - 21.10	**Tim Kügler** *Functionalization of microfabricated cesium vapor cells for optically pumped magnetometers*
21.10 – 21.25	**Marija Ćurčić** *Response of a scalar Mx magnetometer to the transverse modulation of magnetic field*
21.25 – 21.40	**Aleksandra Milenković** *Affordable VCSEL diode laser for high resolution spectroscopy of cesium D1 line*
21.40 – 21.55	**Miloš Subotić** *Frequency Estimating Device for Optically Pumped Magnetometer*
21.55 – 22.10	**Andrej Bunjac** *Analysis of the dynamic RF projection phase in True Scalar Cs Magnetometers*

Table of Contents

Combining size distribution spectrums of ambient aerosols using equivalent optical properties of nanosized particles – selected examples from the Bay of Kotor

Miloš Davidović[1], Duška Kleut[1], Milena Davidović[2], Danka B. Stojanović[1], Milena Jovašević-Stojanović[1]

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Abstract. Atmospheric aerosols in urban areas typically consist of particles of different diameters, which can range in size from a few nanometers to a few micrometers and can have a strong impact on human health [1,2]. This motivates the need to measure aerosol concentration accurately, but it is often also necessary to combine results from several instruments, with fundamentally different measurement principles. In this work, methods based on the measurement of the electrical mobility of particles, for the range of diameters from 10nm to 420nm, and the measurement of the equivalent optical diameter, for the range of diameters from 300nm to 10um, were used. Combining the overlapping region in two size distribution spectra can be used to infer equivalent optical properties of the ambient aerosol, and examples of measured and combined spectra in several urban hot spots in Bay of Kotor are analyzed in some detail. These examples will illustrate several aspects of urban aerosol properties not readily available in a typical regulatory monitoring setting, such as distribution of modes in number and mass concentration, as well as optical properties of measured aerosol.
As the main result, examples of combining particle size spectrums are presented. In the process of combining the particle size spectra, it is possible to modify the distribution obtained by optical measurements by searching for the optimal value of the refractive index of the particles to obtain the best possible agreement with the size distribution obtained by measuring the electrical mobility. An equivalent refractive index as well as the equivalent shape factor of the ambient aerosol is obtained using Mie scattering theory as a theoretical framework [3]. The measurement results from the mobile monitoring campaign in Bay of Kotor in 2017 were used to elucidate the main principles of size spectrum combination, as well as to showcase diversity of equivalent optical properties of urban aerosols.

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Keywords: electrical mobility; equivalent optical diameter; Mie scattering; log normal distribution

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