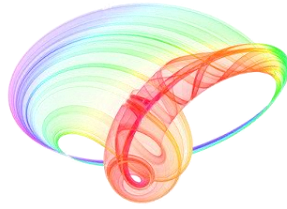


Book of abstracts



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

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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

Fluorescence of bio-molecules a simple and quick method: What honey emission speaks about bee society and honey quality

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Fluorescence is non-destructive, sensitive, simple and fast method for analysis of fluorescent compounds contained in very low amounts (nanomolar concentrations) in the samples. It can be used for structural or concentration studies, in analytical or diagnostic purposes [1]. The fluorescence spectra, in combination with appropriate statistical methods, may provide useful fingerprints in food analysis [2].

Various methods for study of honey quality and adulteration have been in research focus [3]. Over the last years, in different geographic areas a notable loss of honey bee (*Apis mellifera* L.) colonies has been reported. A number of stressors affecting honey bees, including diseases, parasites, pesticides and poor nutrition have been identified [4]. Therefore fast and reliable methods are required for screening bee products both as a tool for assessing quality and to identify risks for colony state.

We used fluorescence spectroscopy combined with advanced statistical analysis in order to identify variability in Fruska Gora lime tree (*Tilia* L.) honey collected at different locations in 2015. Since homogenization of the honey before packing in jars is considered as critical procedure from the Quality Control point of view, we have explored to what extent the ratio of the two main fluorophores in honey, originating from proteins and phenolic compounds change between extraction stage to packaging.

Steady state fluorescence spectroscopy in combination with Multivariate Curve Resolution Alternating Least Squares (MCR-ALS) for spectral analysis has been applied to differentiate samples of honey. The three-dimensional excitation–emission matrix (EEM) is a rapid, selective and sensitive method: by changing excitation and the emission wavelength simultaneously, information regarding the fluorescence characteristics of the different compounds contained in the sample of interest can be obtained [5].

Proteins in honey mainly originate from bees and their quantity depends on bee society [6]. Phenolic compounds come from plant sources. In our study the source was the same – lime from close localities on Fruska Gora. As a control experiment we quantified proteins and phenols in the honey samples.

Changed fluorophore ratio between extraction and packaging stage may indicate that analysed sample was not representative for the particular apiary, or honey homogenization was non-adequate before packaging. This reflects variation in properties of the bee colonies. The contribution of plant source to the honey emission spectra was estimated by comparing emission spectra of lime pollen and honey.

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