The 13th Conference on Integrated Optics – Sensors, Sensing Structures and Methods, IOS 2018

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Conference on Integrated Optics – Sensors, Sensing Structures and Methods (IOS, http://ios.polsl.pl/) is annually co-organized by the Photonics Society of Poland. It covers the topical areas of optics, optoelectronics and photonics in the following aspects: fundamental and applied research, physics and technical materials, components and devices, circuits and systems, technology and design, construction and manufacturing of photonic devices and systems, and metrology.

The 13th Conference on Integrated Optics - Sensors, Sensing Structures and Methods, IOS'2018, took place between 26th February and 2nd March 2018. Traditionally, the Conference was held in Szczyrk at the META Hotel, with over 70 participants from Poland and abroad taking part. Over 60 presentations in the field of photonics, optical metrology and sensorics were widely presented and discussed at the Conference.

Current, 37th, issue of the Photonics Letters of Poland contains 5 selected papers presented during the IOS'2018 Conference. The remaining 5 papers included in this issue are regular regular contributions.

The diversity of the work reported here in the 10 papers covers a large spectrum of technology, theory and characterization of photonic systems and devices.

Ragin *et al.* reports on the bismuth-germanate glasses doped with erbium and holmium ions synthesis. Such glasses co-doped with rare earth ions are promising materials for potential applications functioning in the visible spectral range. Kałużyński *et al.* presents a simple design of non-invasive, optical probe system, which can be successfully used for early skin cancer diagnosis. The most important features of the proposed method, so-called as the "optical biopsy", are its sensitivity and specificity, as well as the speed of data acquirement. It can be used as a complement to classic methods (e.g. histopatology) for early cancer detection. In the letter by Cimek *et al.* successful synthesis of ZBLAN glasses is reported. Authors show that synthetized glasses have a transmission window extending from 0.2 to 8.0μm, what allows for fabrication of lenses and (photonic crystal) fibers for mid-infrared applications. A new way for constructing and developing LC-based waveguiding structures, obtained by polymer-stabilization of LC molecular orientation, is presented by Rutkowska *et al.* In this work differences in the methodology of their practical realization are discussed. Finally, in the last paper related to the IOS'2018 Conference and written by Lesiak *et al.*, the possibility to exploit the properties of graphene oxide to design a fiber Bragg grating – based UVA radiation sensor. The obtained results show that UV-light focused on the fiber Bragg grating covered by graphene oxide induces measurable shift of the Bragg wavelength observed in reflected spectrum. Studies on 2D structure composed of nano-slits of desired geometry, which can act as either unidirectional and bidirectional coupler for Metal Insulator Metal waveguide, can be found in a letter by Udupy *et al.* Numerical simulations have been performed using the FEM technique and the obtained results confirm the validity of the proposed structure and its design. Saris *et al.* introduces a new interface of an optical pin for Printed Circuit Boards. The V-shape cut type of an optical pin proposed by authors is an innovative when compared to the 90-degree cut type of optical pin. Such evolution of the optical pin interference is believed to lead to substantial advances in optical interconnection in the next future. Mazen S. Nairat investigates the Bessel beams of different types. As a result, analytical expressions for both linear and angular momentum densities of Bessel, Gaussian-Bessel, and Hankel-Bessel beams are determined. Specifically, the axial angular momentum has been resolved as an interpretation of physical light momentum and it is applicable not only to the Bessel beams but also to and arbitrary light beam of cylindrical symmetry. Electrochemical deposition of $Cd_{1-x}Zn_xO$ films on p-Si substrates, and thus synthesis of the heterojunction of p-Si/ $Cd_{1-x}Zn_xO$ has been described in the letter by Mamedov *et al.* The electric and photoelectric properties of such heterojunction has been investigated depending on deposition potential and films compositions. Eventually, the spectroscopic properties of Yb^{3+} doped and Yb^{3+}/Nd^{3+} co-doped oxyfluorosilicate glasses have been investigated by Umamaheswar *et al.* They exhibit good thermal stability and may be suitable for fiber lasers applications.

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