EuroSciCon

EuroSciCon Joint Event on

Laser Optics & Photonics and Atomic & Plasma Science

July 16-17, 2018
Prague, Czech Republic

Dror Malka et al., Am J Compt Sci Inform Technol 2018, Volume 6
DOI: 10.21767/2349-3917-C1-001

RGB WAVELENGTH DEMULTIPLEXER BASED ON PHOTONIC CRYSTAL FIBER

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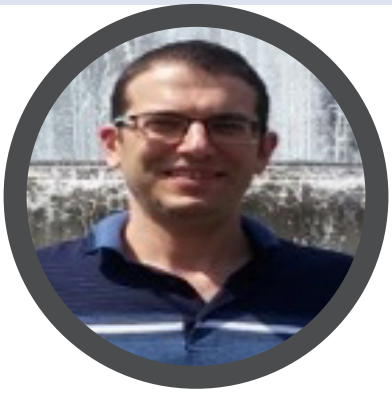

High transmission losses are the key problems that limit the performances of visible light communication (VLC) systems that work on wavelength division multiplexing technology. In order to overcome this problem, we propose a novel design for a 1×3 optical demultiplexer based on photonic crystal fiber (PCF) structure that operates at 450 nm, 550 nm, 650 nm. The new design is based on replacing some air-holes zones with silicon nitride material along the PCF axis with optimization of the PCF size. Numerical investigations were carried out on the geometrical parameters by using a beam propagation method. Simulation results show that the proposed device can transmit 3-channel that works in the visible range with low crosstalk ((-18.63)-(-21.24) dB) and bandwidth (5.79-18.63nm). Thus, this device can be very useful in VLC networking systems that work in wavelength division multiplexing technology for increasing VLC speed.

Biography

Dror Malka received his BSc and MSc degrees in Electrical Engineering from Holon Institute of Technology (HIT) in 2008 and 2010, respectively, Israel. He has also completed a BSc degree in Applied Mathematics at HIT in 2008 and received his PhD degree in Electrical Engineering from Bar-Ilan University (BIU) in 2015, Israel. Currently, he is a Lecturer in the Faculty of Engineering at HIT. His major fields of research are Nanophotonics, Super-Resolution, Silicon Photonics and Fiber Optics. He has published around 27 refereed journal papers, 22 conference proceeding papers, 2 book chapters and one patent.

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