Frequency conversion in two-dimensional photonic structure

Babic, L.

Curriculum Vitæ

Ljubiša Babić was born on the 1st of April 1982 in the city of Dubrovnik, Croatia. In the period between 1997 and 2001, he attended the Gymnasium Ivan Goran Kovačić in Herceg Novi, a coastal town in Montenegro. During that time he became interested in physics winning the first place in the Montenegrin National Physics Olympiad two times in a row, in 1998 and 1999. In 2001, he entered the Faculty of Electrical Engineering of the University of Belgrade in Serbia and enrolled in the Master's program. For his Master's research project Ljubiša investigated theoretically the electronic transport in a p-n junction made in gallium arsenide. The research was carried out in the Department of Physical Electronics under supervision of Prof. Dr. P. Matavulj and Prof. Dr. J. Radunović.

In Belgrade he became very interested in the physics of nanostructures, in particular their electronic and optical properties. Therefore, he decided to continue his education abroad and learn more about experimental research in the field of photonics. In September 2006, he started his Ph.D. research in experimental physics in the Quantum Optics Group at Leiden University under supervision of Dr. M. J. A. de Dood and Prof. Dr. J. P. Woerdman. The aim of the research was to experimentally investigate linear and nonlinear optical properties of semiconductor III-V photonic crystals and nanowires. Ljubiša fabricated photonic crystals in the Kavli Nanolab Delft, whereas the nanowire samples were fabricated in the facilities of Philips Research. The results of the research are presented in this thesis.

List of publications

Journal articles

- Lj. Babić and M. J. A. de Dood, *Interpretation of Fano lineshape reversal in the reflectivity spectra of photonic crystal slabs*, Opt. Express **18**, 26569–26582 (2010). (*Chapter 5 of this thesis*)

- Lj. Babić, R. Leijssen, E. F. C. Driessen, and M. J. A. de Dood, *Method to transfer photonic crystals to a transparent gel substrate*, in preparation. (*Chapter 4 of this thesis*)

- Lj. Babić, L. T. H. van Dellen, and M. J. A. de Dood, *Second harmonic generation in transmission from photonic crystals on a gel substrate*, in preparation. (*Chapter 6 of this thesis*)

Conference proceedings

- Lj. Babić, P. Matavulj, and D. Radunović, *Analysis of fast transient processes during formation of the pn junction made of a two-valley semiconductor*, Proceedings 50th ETRAN Conference, Vol. IV, p. 80 (2006).

- M. J. A. de Dood and Lj. Babić, *Leaky Modes of Two-Dimensional Photonic Crystals Transferred to a Low Refractive Index Substrate*, in Frontiers in Optics, OSA Technical Digest (CD) (Optical Society of America, 2010), paper FThJ6. (*Chapters 4 and 5 of this thesis*)

- Lj. Babić and M. J. A. de Dood, *Fano lineshape reversal in the reflectivity spectra of photonic crystals transferred to a gel substrate*, Proceedings Annual Symposium of the IEEE Photonic Benelux Chapter, p. 53 (2010). (*Chapters 4 and 5 of this thesis*)

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