

## “Optical Fibres and Their Applications”

This Special Issue of *Bulletin of the Polish Academy of Sciences: Technical Sciences*, like the two previous editions (vol. 53, no. 2, 2005 and vol. 56, no. 2, 2008) is devoted to selected papers which were originally presented at two periodic conferences ‘Laser Technology’ held in Świnoujście in September 2009’ and ‘Optical Fibers and Their Applications held in Krasnoblód in October 2009’. The selection of conference papers represents the wide spread of topics covered by contributors.

The group of the first five papers, presented within the frame of The Laser Technology Conference, concentrates on different issues concerning novel laser devices and techniques.

The rapid development of the terahertz technique has been observed due to its numerous and important applications in various fields of science and technology. The review of continuous wave optical devices for excitation and detection of the THz radiation is provided by the first paper of this Issue. The next two papers concern the semiconductor optoelectronic devices. The construction and the main operation characteristics of the developed quantum cascade laser operating at  $9.4 \mu\text{m}$  are presented in the first paper. The second one contains the description of a mode-diode locked pulse laser of 110 fs developed by using the semiconductor saturable absorber mirror grown by molecular beam epitaxy. The next two papers deal with the subject of fiber lasers. One of the papers presents research results on a two-stage power amplifier for MOPA application for the third telecommunication window. The last paper of the group contains the analysis of technological and construction conditions that limit energy parameters of fiber lasers.

The selected papers presented at the conference on Optical Fibers and Their Applications discuss problems related to various aspects of optical waveguides physics and technology. The paper on the thermal tuning sensitivity of the long period fiber gratings with a liquid crystal cladding layer shows possibility of obtaining a temperature-independent attenuation band or the band with high temperature sensitivities. In the next paper the results of the numerical analyses of the planar waveguides made of material with high values of the refractive index and with Bragg grating couplers are presented. The comparison of theoretical predictions with the experimental results of reflectometric (OTDR) measurements is given in the paper dealing with the splice loss in thermally expanded core of a single mode telecommunication fiber. The following paper of this group contains analysis of the influence of rare earth ions such as  $\text{Tm}^{3+}$  and  $\text{Yb}^{3+}$  on physical and chemical properties of doped tellurite glasses for optoelectronic devices.

The last paper of this issue presents the results of numerical analysis concerning current-voltage characteristic of p-on-n long wavelength infrared HgCdTe photodiodes. The theoretical predictions are compared with experimental data published in the available literature.

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Wiesław L. Woliński  
Warsaw University of Technology  
*Co-editor*