
FOREWORD

Special Section on Recent Progress in Active Photonic Device Technologies

Active photonic devices have been making remarkable progress and are getting more and more important in a variety of fields, such as electronics, information and communications. Since communication traffic is still continuing to grow, the increase of transport capacity in optical fiber networks for long haul, metro and access systems is strongly demanded, where the active photonic device as one of the major components is deployed in optical transmitters and receivers. Adding new functions, improvement of their characteristics and reduction of power consumption have recently been expected. One of the remarkable fundamental research topics is recent progress in micro- and nano-lasers, especially metallic and plasmonic nano-lasers. Moreover large capacity of optical interconnection is also demanded in data center networks. In addition to the application of optical communications, active photonic devices have been steadily developed for the use in a wide wavelength range, such as optical recording, displays, and optical sensors. It should be also noted that technologies of analysis, mounting, measurement, and reliability have been intensively developed to support the progress of those active photonic devices.

The purpose of this Special Section is to explore recent research progress related to the subjects. This section contains 6 papers including 1 invited paper.

I would like to express my sincere thanks to all the authors for their contributions to the special section. I also appreciate the editorial committee members and reviewers. Despite of the busy and tight schedule, they spent precious time to do hard work for editing and reviewing papers. Without their efforts, we could not get this invaluable special section.

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Hitoshi Kawaguchi (*Fellow*) received the B.E. degree in electronics from Niigata University, Niigata, Japan, in 1972 and the M.E. and Ph.D. degrees in electronics from Tohoku University, Sendai, Japan, in 1975 and 1982, respectively. Currently, he is working with the Graduate School of Materials Science, Nara Institute of Science and Technology, Ikoma, Nara, Japan. Since joining Nippon Telegraph and Telephone Public Corporation, Electrical Communication Laboratory, Musashino, Tokyo, Japan, in 1975, he had been engaged in research and development of semiconductor lasers, optical bistability and instability in semiconductor lasers, optical bistability in multiple quantum wells, and semiconductor optical switches. He became a Member of the Faculty of Engineering, Yamagata University, Yonezawa, Japan, in 1988. He spent one year from 1990 to 1991 at Cambridge University, Cambridge, U.K., as a Science and Engineering Research Council Visiting Fellow. He was also with the Swiss Federal Institute of Technology, Zurich, Switzerland, as an Invited Professor. He is presently a Professor with the Ultrafast Photonics Research Group, Graduate School of Materials Science, NAIST. His research interests are in the areas of optoelectronics, photonics devices, femtosecond technology, spintronics, and nonlinear materials. He is the author or co-author of more than 300 research papers and of the book *Bistabilities and Nonlinearities in Laser Diodes* (Norwood, MA: Artech House, 1994). He received the KDDI Foundation Research Award in 2010 and the Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology (Prizes for Science and Technology). From 2010 to 2011, he served as the chair of the Lasers and Quantum Electronics (LQE) Technical Committee of IEICE. Dr. Kawaguchi is a Member of the Japan Society of Applied Physics, the Physical Society of Japan, the Optical Society of America, the IEEE Photonics Society, and the International Society for Optical Engineering.

