LASERS FOR DATACOM AND COMPUTERCOM APPLICATIONS

DR. SHINJI MATSUO
NTT PHOTONICS LABORATORIES, NTT CORPORATION

The power consumption and data transmission capacity of optical networks in data centers and supercomputers are growing in importance due to the increase in Internet traffic. Furthermore, intra-board and on-chip optical networks will play a key role in reducing the power consumption of routers and servers. Thus, the main challenge is to realize directly modulated lasers with low power consumption and low cost. Membrane buried heterostructure (BH) lasers, in which low refractive index materials such as air and SiO2 are beneath the laser, have attracted a lot of attention because the increase in the optical confinement factor enables us to achieve both low power consumption and a high modulation speed. For low-cost device fabrication, the use of large Si wafers and sophisticated CMOS fabrication technologies is important. In this talk, we will describe the fabrication of DFB laser on SiO2/Si substrate, using epitaxial growth of InP on directly bonded thin InP-based film on a Si substrate. We also describe the photonic crystal lasers for computercom

Shinji Matsuo received the B.E. and M.E. degrees in electrical engineering from Hiroshima University, Hiroshima, Japan, in 1986 and 1988, and the Ph.D. degree in electronics and applied physics from Tokyo Institute of Technology, Tokyo, Japan, in 2008.

In 1988, he joined NTT Opto-electronics Laboratories, Atsugi, where he was engaged in research on photonic functional devices using MQW-pin modulators and VCSELs. In 1997, he researched optical networks using WDM technologies at NTT Network Innovation Laboratories, Yokosuka. Since 2000, he has been researching high-speed tunable lasers for photonic packet switching and photonic crystal lasers for computercom applications at NTT Photonics Laboratories, Atsugi. He is a group leader of Nano-structure Photonic Device Research Group.

Dr. Matsuo is a member of the IEEE Photonics Society, Japan Society of Applied Physics and the Institute of Electronics, Information and Communication Engineers (IEICE) of Japan. He received the Opto-Electronic Integration Technology Award (Izuo Hayashi Award) in 2013. He serves as a Program Committee Member of CLEO, ISLC and OFC. He also serves as a Chair of Technical Committee on Lasers and Quantum Electronics (LQE) in Electronics Society of IEICE.